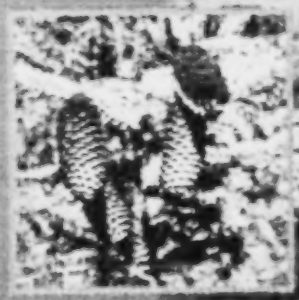
Ontario

Annual Report on Forest Management 2001/2002



FOREST INFORMATION SERIES

105-00102/

Annual Report on Forest Management

For the year April 1, 2001 to March 31, 2002

Minister of Natural Resources of the Province of Ontario

To his Honour
The Lieutenant-Governor of the Province of Ontario

May it please your Honour

The undersigned begs respectfully to present to your Honour the Annual Report on Forest Management for the fiscal year beginning April 1, 2001 and ending March 31, 2002.

David Ramsay
Minister

March, 2004

© 2004, Queen's Printer for Ontario
Printed in Ontario, Canada
Single copies of this publication are available at no charge from the address noted below. Bulk orders may involve charges.

Ministry of Natural Resources
Natural Resources Information Centre
300 Water Street
Peterborough, ON K9J 8M5

Current publications of the Ontario Ministry of Natural Resources, and price lists, are also available from this office.

Telephone inquiries about ministry programs and services should be directed to the Natural Resources Information Centre:

General Inquiry 1-800-667-1940
Renseignements en français 1-800-667-1840
FAX (705) 755-1677

Find the Ministry of Natural Resources on-line at:
www.mnr.gov.on.ca

Cette publication est également disponible en français.

Table of Contents

Index of Figures ---------- v

Index of Tables ---------- vi

Executive Summary ---------- vii

Chapter 1 **Introduction** 1

Timber Class EA Approval 1
Annual Report on Forest Management 1
Other Information Sources 2

Chapter 2 **Forests of Ontario** 5

Ecological Subdivisions 6
Administrative Subdivisions 9
Ontario's Forest Inventory 11
Parks and Protected Areas 11
Private Woodlands 13

Chapter 3 **Forest Management Planning** 17

Timber EA Renewal 18
Forest Management Planning Manual Revision 18
Forest Information Manual 19

Chapter 4 **Forest Industry and Government Revenue** 21

Forest Products Industry 21
Forest Sector Employment 23
Harvest Licence System 23
Resource Stewardship Agreements 23
Ontario's Stumpage System 23

Chapter 5 Forest Access Roads 25

Road Construction and Maintenance 25

Road Access Control and Abandonment 26

Chapter 6 Forest Disturbance and Harvest 29

Natural Disturbances 30

Forest Harvest 34

Chapter 7 Forest Renewal and Maintenance 41

Forest Renewal 41

Forest Maintenance 45

Funding for Forest
Renewal and Maintenance 47

Chapter 8 Monitoring, Compliance and Audit 49

Silvicultural Effectiveness Monitoring 49

Effects Monitoring 51

Compliance Monitoring 51

Independent Forest Audits 54

Forest Certification 65

Chapter 9 Aboriginal Peoples 67

Term and Condition #77 67

Implementation of T&C #77 67

District Progress 69

Chapter 10 Research, Scientific Studies, Technical and Policy Development 87

New and Improved Data and Information Sources 87

New Policies, Procedures, and Gu...es 91

New Forest Management Methods, ...dels, and Tools 94

Long-Term Monitoring Programs And Scientific Studies 99

Appendices 103

Index of Figures

Figure 2a Land classes of Ontario 5
Figure 2b Forest regions of Ontario. 6
Figure 2c Landscape typical of the Hudson Bay Lowlands. 6
Figure 2e Typical maple forest found in the Great Lakes-St. Lawrence Forest. 7
Figure 2d Typical jack pine forest found within the Boreal Forest. 7
Figure 2f Multi-species hardwood forest typical of the Deciduous Forest region. 8
Figure 2g Ecological regions of Ontario. 8
Figure 2h Forest management zones in Ontario. 9
Figure 2i Extent of the Planning Area. 9
Figure 2j MNR administrative boundaries. 10
Figure 5a Road construction by road class and MNR region. 26
Figure 5b Road maintenance by road class and MNR region. 26
Figure 5c Road access control by control method and MNR region. 27
Figure 5d Road abandonment by road class and MNR region. 27
Figure 5e Road construction and abandonment. 28
Figure 6a The forest life cycle 29
Figure 6b Area disturbed by forest fire. 30
Figure 6c Area infested by forest insects. 31
Figure 6d Estimated AOU volume lost to forest insects. 32
Figure 6e Estimated provincial wood volume lost to tree diseases. 32
Figure 6f Severe weather damaged area. 33
Figure 6g Estimated AOU wood volume lost to insects, disease, and severe weather. 34
Figure 6h Area harvested by silvicultural system. 36
Figure 6i Area harvested by fiscal year and MNR region. 37
Figure 6j Forest area disturbed by harvest and fire for all Crown land. 37
Figure 6k Salvage area harvested. 37
Figure 6m Wood volume harvested by MNR region and species group. 38
Figure 6l Hardwood and softwood volumes harvested on Crown land. 38
Figure 6n Wood volume for harvest and other disturbances in the AOU. 39
Figure 7a Regeneration area by silvicultural system. 43
Figure 7b Natural and assisted regeneration area. 43
Figure 7c Number of trees and container stock planted. 44

Figure 7d Seeding and site preparation area. 44
Figure 7e Provincial forest regeneration area. 44
Figure 7f Five-year harvest and regeneration levels in Ontario. 45
Figure 7g Provincial tending activities. 46
Figure 7h Funds input to the Forestry Futures Trust Fund. 47
Figure 8a Summary of area declared free-to-grow by MNR region. 50
Figure 8c Percent assessed area declared free-to-grow by MNR region. 50
Figure 8b Summary of area declared free-to-grow by fiscal year. 50
Figure 8d Status of forest certification in Ontario, March 31, 2002. 65

Index of Tables

Table 2a Private forests managed under the Managed Forest Tax Incentive Program, by MNR region.. 14
Table 2b Summary of Ontario Stewardship accomplishments for 2001/02 15
Table 2c Number of municipalities with tree cutting bylaws in Ontario 16
Table 4a Persons participating in forest-based leisure activity in Ontario 22
Table 4b Ontario forest products sector sales 22
Table 4c Distribution of manufacturing activities by sector and direct employment within each sector 22
Table 4d Crown production forest area under licence in 2001/02, by licence type 23
Table 4e Minimum stumpage charge per cubic metre 24
Table 4f Crown charge payments by the forest industry 24
Table 6a Estimated wood volumes lost to forest fires within the AOU 30
Table 6b Estimated wood volumes lost to insects within the AOU 32
Table 6c Estimated wood volumes lost to disease within the AOU 33
Table 6d Estimated wood volumes lost to severe weather within the AOU 33
Table 6e Harvest volume by species, 1996/97 - 2000/01 (cubic metres) 39
Table 7a Provincial renewal operations, 2001/02 42
Table 7b Provincial tending activities, 2001/02 45
Table 7c Provincial forest renewal expenditures, 2001/02 48
Table 8a Forest operations compliance inspection reports summary, 2001/02 53
Table 8b Remedy and enforcement action taken, 2001/02 54
Table 8c 2001 Independent Forest Audits 55
Table 8d Independent Forest Audit results for 2001 audits 56
Table 8e Summary of 1996-2001 audit reports 64

Executive Summary

In 1994, the Environmental Assessment (EA) Board in Ontario issued its decision on the *Class Environmental Assessment by the Ministry of Natural Resources for Timber Management on Crown Lands in Ontario.* The EA Board's decision approved the timber management process described by the Ministry of Natural Resources (MNR), with 115 binding terms and conditions. One of these conditions required the MNR to table an annual report on forest management in the provincial legislature.

This is the seventh of MNR's annual reports. It covers the fiscal year April 1, 2001 to March 31, 2002. Because of the time period when data was collected, some of the information refers to the 2000/01 fiscal year.

The forest management legislative and policy framework of the MNR has undergone significant improvements in the last decade. The *Crown Forest Sustainability Act* (CFSA), which came into effect in 1995, requires anyone operating in an Ontario Crown forest to ensure the long-term health of the forest so that the benefits from the province's forests are available to future generations.

The MNR has instituted changes affecting the responsibilities of the forest industry, the opportunities for the general public to become involved in forest management planning, the system for licensing forest companies, the fees paid to harvest wood, and has stabilized the dedicated funding for forest renewal.

Announced in 1999, Ontario's Living Legacy represents a milestone in natural heritage protection and provides a land use strategy for an area covering 45 per cent of the province. Ontario's Living Legacy established 378 new parks and protected areas, covering 2.4 million hectares, and brings the total area of provincial parks and protected areas in Ontario to 9.5 million hectares. The regulation of the 378 parks and protected areas is a very complex process and each site requires additional local consultation to finalize the boundaries. As of May 31, 2002, 129 sites have been regulated. The combination of the area of these new parks and protected areas, existing parks, and other areas normally excluded from harvesting has reduced the total area within Ontario where forest harvest operations are allowed to occur.

Ontario has 5.6 million hectares of productive forest land under private ownership, 14 percent of the province's inventoried productive forest landbase. Private forests account for 13.5 percent of Ontario's growing stock, including approximately one-half of the volume of hard maple and "other hardwoods". In 2001, eight percent of the volume of conifers and 24 percent of the volume of deciduous species processed in Ontario originated from private woodlands. This represents 13 percent of the total wood volume processed.

Ontario's 107.6 million hectare area is comprised of about 88.7 million hectares of land and 18.9 million hectares of water. The Area of the Undertaking (AOU), where most forest management activities on Crown land occur, totals 38.5 million hectares of forest. Productive forest on Crown land in the AOU covers about 33.6 million hectares, with 21.8 million hectares of this area eligible for forest management activities. The focus of this annual report is to provide information on the activities carried out on the eligible 21.8 million hectares of Crown forest in 2001/02.

As of April 1, 2001, the AOU was divided into 55 management units. The fifty-sixth management unit is comprised of all the pieces of Crown land in southern Ontario outside the AOU.

The CFSA requires that an approved Forest Management Plan be in place for each management unit before any forest management operations take place. A Forest Management Plan covers a 20-year period and describes the values of the forest in a management unit, as well as the harvesting, renewal, and other forest management activities that will occur. These plans are renewed every five years through a process that provides opportunities for public input. In 2001, 17 Forest Management Plans were approved and implemented.

The effective period of the approval for timber management activities under the Environmental Assessment Act covers nine years (1994 to 2003). One of the conditions of this approval requires the MNR to undertake a comprehensive review of the forest management activities covered by the approval, and to submit a report containing its findings for amending and extending the approval. Under the Timber EA Renewal Project efforts to prepare the report, initiated in 2000/2001, were continued in 2001/2002.

The Forest Management Planning Manual Revision Project was initiated in June 2001, following the completion of the Forest Management Planning Improvement Project. The principal accomplishment during 2001/2002 was the establishment of several focus groups to answer specific questions of a technical nature that were not resolved by the Forest Management Planning Improvement Project. In addition, a writing team was formed to begin the actual work on proposed revisions to the *Forest Management Planning Manual for Ontario's Crown Forests*.

The *Forest Information Manual* is one of four regulatory manuals required by the CFSA. This manual describes the requirements for exchanging information concerning the management of Crown forests between the forest industry and the MNR. The *Forest Information Manual* was approved into regulation on April 25, 2001, and initial implementation efforts continued through the fiscal year.

The CFSA provides for two types of licences: Forest Resource Licences (FRLs) and Sustainable Forest Licences (SFLs). In 2001/02, there were a total of 3,328 licences in place in Ontario, covering a total of about 25.5 million hectares of productive forest area. This area includes areas excluded from normal harvesting activities, such as protection forest and areas of identified wildlife, Aboriginal and cultural values.

Forest management operations require a complex system of primary and secondary roads, the cost of which is now borne largely by forest companies. In 2001/02, 617 kilometres of primary and secondary roads were constructed in Ontario forests to serve forest management activities. Maintenance work was carried out on another 17,320 kilometres of roads. A total of 3,835 kilometres of roads had access controls, while almost 600 kilometres of forest roads were abandoned in 2001/02.

The figures used for disturbance and harvest area and volume in this report are from 2000/01, since data collection on harvesting and other disturbances is not completed until the following year. In 2000/01 forest fires occurred on only 1,712 hectares of productive forest in the AOU, resulting in a loss of 413

thousand cubic metres of wood. There were approximately 8.2 million hectares of insect-infested forest in the AOU where significant mortality occurred, and almost 7.3 million hectares on which significant growth loss occurred due to insect damage, resulting in a total loss of almost 6 million cubic metres of wood. Annual volume losses from disease in the AOU in 2000/01 were approximately 13.3 million cubic metres, while weather damage of almost 350 thousand cubic metres occurred on 111 thousand hectares of forest.

Harvesting activities took place on 220,400 hectares of forest in 2001/02. The clearcut silvicultural system was used on 87.7% of the area harvested. In 2000/01, 44 management units within the Boreal Forest reported average clearcut sizes from 14 to 1,935 hectares. Maximum clearcut sizes reported ranged from 55 to 3,063 hectares. Twelve management units within the Great Lakes-St. Lawrence Forest reported average clearcut sizes from 4 to 40 hectares. Maximum clearcut sizes ranged from 18 to 258 hectares. A total of almost 24.7 million cubic metres of wood was harvested within the AOU in 2000/01

The CFSA requires a portion of the money received from forest companies to be designated exclusively for forest renewal activities. In 2001/02, the Government of Ontario received a total of approximately $171 million from timber sales, of which over $81 million went directly to funds designated for the maintenance and renewal of the forest, and for work associated with ensuring the future of the forest. In the same period, a total of approximately $105 million was spent on forest renewal activities.

Renewal of the forest occurs both naturally and with assistance. In 2001/02, natural regeneration, both even and uneven-aged, took place on 112,735 hectares of land. Assisted renewal was carried out on 117,566 hectares. Site preparation activities, through mechanical means, use of herbicides, and prescribed burning, were completed on another 77,270 hectares. Tending activities were also conducted to improve the quality and growth of some areas of the forest. During 2001/02 tending activities, such as thinning, were carried out on 98,793 hectares of forest. There were no protection activities (e.g., aerial application of insecticides) reported for 2001/02.

Free-To-Grow (FTG) assessments are an effectiveness monitoring tool that provides an indication of the success of silvicultural treatments and information to project the future forest condition. In 2001/02, 215 thousand hectares were assessed in 35 management units. Of the total area assessed for FTG, 70 percent was approved as having achieved the FTG standard within a set time period.

This is the fourth annual report to provide results of industry compliance self-monitoring and reporting. The forest industry is required to report the results of their inspections to the MNR, which conducts inspections to verify all instances of non-compliance reported by companies. The MNR also carries out random and other planned inspections of forest operations. Of the 8,870 inspections undertaken across the province, companies conducted 6,753 and the MNR completed 2,117. The vast majority of the inspections reported compliant operations. A total of 113 remedial actions were required by the MNR, including warnings, "stop work" orders, and administrative penalties.

All management units within the AOU must be audited at least once every five years. In 2001/02, Independent Forest Audits were conducted on a total of 20 management units. These included the Algoma, Armstrong, Auden, Black River, Black Sturgeon, French-Severn, Lac Seul, Lake Nipigon, Magpie, Nipissing, Pic River Ojibway, ShiningTree, Sioux Lookout, Spruce River, Sudbury, and Wawa forests, and the Bancroft, Kiashke River, Minden, and Temagami management units.

Forest certification involves an independent third party evaluating forest management systems and/or operations against ecological, economic and social standards. In Ontario, 10 SFL managers, one SFL-like agreement manager, eight overlapping licensees and three private forest managers have been successful in obtaining International Organization for Standardization 14001 registration of their operations. In addition, Westwind Forest Stewardship Inc., a SFL holder, three privately owned forests and one municipal forest have been certified by a Forest Stewardship Council-accredited certifier.

This report documents for 2001/02 the efforts of MNR districts and First Nations communities to im-

plement ways of achieving a more equal participation by Aboriginal peoples in the benefits derived from forest management activities.

A primary monitoring responsibility of the MNR is to assess the effects of forest management activities on the forest ecosystem over the long term. The final chapter of this report details policies, procedures, scientific studies and research that the MNR is undertaking to ensure that forest management guides, data, methodologies, and underlying science are available to effectively monitor and manage forest management activities.

Chapter 1 Introduction

Management of Ontario's forests has evolved through past decades from managing for timber to stewardship for all the values of the forest. With the 1995 introduction of the *Crown Forest Sustainability Act* (CFSA)[1], Ontario adopted a policy of managing Crown forests according to the principles of sustainable forest management. Large, healthy, diverse, and productive forests and their associated ecological processes and biological diversity are conserved for future generations through the balancing of the environmental, economic and social components of forest sustainability.

Timber Class EA Approval

Forest management has also been guided by the *Environmental Assessment Act*. In 1988, the Environmental Assessment (EA) Board began an assessment of the Crown land timber management planning process of the Ministry of Natural Resources (MNR), the agency responsible for forest management in Ontario. Six years later, after extensive public hearings, the Board released its *Reasons For Decision And Decision, Class Environmental Assessment by the Ministry of Natural Resources for Timber Management on Crown Lands in Ontario* (Timber Class EA approval) for a large part of the province, referred to as the Area of the Undertaking. The EA Board approved the MNR's planning process for Crown forests with 115 terms and conditions. A stipulation was that the MNR prepare an annual report to provide the Legislature and the public with information on Ontario's Crown forests.

Annual Report on Forest Management

This is the seventh annual report on forest management, covering the period April 1, 2001 to March 31, 2002. Note that information on forest disturbances, such as harvesting, forest fires, and insects, is from 2000/01. Disturbed areas are mapped and invento-

[1] All acronyms used in this report are defined in an appendix at the end of the report.

ried in the fall of the year the disturbances occurred, to allow time to complete information gathering. Therefore, collection of data on disturbances is completed too late in any given year for it to be included in a report on activities during that same year.

Updated Data and Information

New or updated data and information submitted since the previous *Annual Report On Forest Management* are included in this report. When referenced, errors or omissions noted since the publication of the previous report are also corrected or updated in this report. Five-year tables and graphs are included in this report to provide updated information and a means to view and assess trends in the data.

Overview

As of April 2001 Ontario's Crown forests are divided into 56 management units. Each of the 55 management units within the area of the undertaking is managed according to a 20-year Forest Management Plan (FMP), which is renewed every five years through a process established in law. This annual report provides a list of FMPs (in various stages of development) to be implemented from 2001 to 2004 inclusive, following their approval.

Also included in this report is an overview of the licensing and revenue-generating system for forest management activities, and updates on the most recent road access, harvesting, and renewal activities on Crown forests. Forest management activities and their effects are monitored and audited by the MNR to ensure FMPs are being followed appropriately, and to check on the long-term health of the forest. These monitoring, compliance and audit systems are explained in this report. An update is also provided on the MNR's progress in negotiations with Aboriginal peoples regarding opportunities for increased participation in the benefits of forest management. The report concludes with progress reports on MNR's research, scientific studies, and technical and policy development programs.

With this annual report, the MNR provides information to help in understanding how Ontario's Crown forests are being managed, as well as baseline information to compare with future forest management activities and annual reports.

Other Information Sources

Other documents are available to provide information about forest management in Ontario. They include:

- the *Reasons For Decision And Decision, Class Environmental Assessment by the Ministry of Natural Resources for Timber Management on Crown Lands in Ontario*, which contains the reasons for the approval of the forest management planning process, and the terms and conditions that form part of the Timber Class EA approval;
- the *Crown Forest Sustainability Act*, enabling legislation which provides for the regulation of forest planning, public involvement, information management, operations, licensing, trust funds for reforestation, processing facilities, remedies and enforcement;
- the *Policy Framework for Sustainable Forests*, which lays out the principles for managing forests sustainably in Ontario;
- the MNR's *Statement of Environmental Values*, which sets out the environmental principles that govern the MNR's management of Ontario's natural resources;
- the *Forest Management Planning Manual for Ontario's Crown Forests*, which provides direction for all aspects of forest management planning for management units in the Area of the Undertaking;
- the *Forest Operations and Silviculture Manual*, which is a compendium of guidance and direction for the conduct of operations authorized by approved FMPs;
- the *Scaling Manual*, which provides standard instructions for determining the quantity, quality and movement of Crown timber harvested in Ontario;

- the *Forest Information Manual*, a technical document that describes the requirements and standards for information needed to support forest management planning on Crown lands in Ontario;
- the *Forest Resource Assessment Policy*, which provides provincial direction for the assessment of Ontario's Crown forest resources. This policy supports the provisions in the CFSA for determining forest sustainability and managing Ontario's Crown forests in a sustainable manner.
- the *Forest Resources of Ontario 2001*, a snapshot of statistics on the state of Ontario's forests;
- the *State of the Forest Report, 2001*, the first such report on the condition of Ontario's forest resources, for the period 1995-2000 (as required by Appendix 22 of the Timber Class EA approval, the CFSA, and the *Forest Resource Assessment Policy*); and,
- Ontario's forest management guides, which include technical considerations, standards, guidance, and performance targets used during the preparation and delivery of FMPs. They may also include suggestions on the best ways of carrying out forest management operations, sometimes referred to as "best management practices".

Further information on these information sources, and download of electronic versions of many of these documents, is available from the MNR's website: http://ontariosforests.mnr.gov.on.ca/spectrasites/internet/ontarioforests/publications.cfm

FOREST INFORMATION MANUAL

The *Forest Information Manual* is a technical document describing, in detail, the types of information needed to support forest management planning on Ontario's Crown lands. The manual supports the authority of the Minister of Natural Resources to require details about Crown forests from any party. It is the last of four manuals to be regulated under the CFSA, and supports and complements the other three regulated documents, considered to be operational in nature.

The *Forest Information Manual* identifies and describes the requirements for providing information about Crown forests to the Minister of Natural Resources, to support forest management planning on Crown lands and to ensure compliance with the CFSA and its regulations. These requirements affect primarily the forest companies that conduct their activities on Crown lands (in accordance with an approved FMP), and the MNR, which provides data to the forest companies to support forest management planning. The *Forest Information Manual* is therefore intended mainly for forest management planning team members (foresters, forest technicians, planning specialists and biologists), and for those responsible for preparing the various communications vehicles used to support forest management planning. These include information products such as maps, annual reports, compliance inspection reports, forest operations prescriptions, and forest resource inventories.

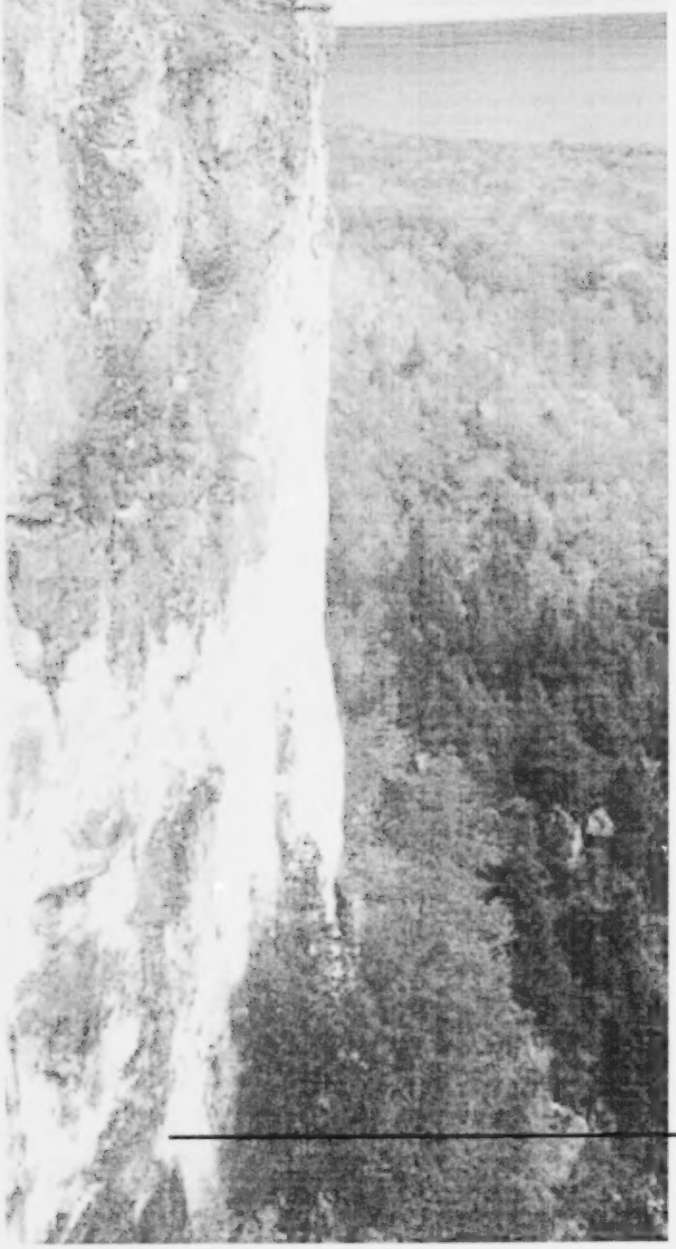
STATE OF THE FOREST REPORT, 2001

The MNR's mission is *to manage our natural resources*, and in this case specifically those that are forest based, *in an ecologically sustainable way to ensure they are available for the enjoyment and use of future generations*. In support of this, Ontario now reports comprehensively on the status of Ontario's forest resources every five years. Ontario's first *State of the Forest Report, 2001* supplies detailed information on Ontario's forests for the five-year period 1995/96 to 1999/2000.

This 340 page report includes an overview of Ontario's forests regions, its managed forests, and Ontario's industrial wood supply. The legal and policy requirements for state of the forest reporting in Ontario are described. The provincial, national and international context for state-of-the-forest reporting and the evaluation of forest sustainability, using criteria and indicators of sustainable forest management, is outlined.

The *State of the Forest Report, 2001* describes Ontario's forests and forest management, using criteria and indicators of sustainable forest management. Sixty-four Ontario-specific, environmental, social, and economic indicators are described and applied in an Ontario context, using the key forest values that residents want to sustain and enhance for their forests.

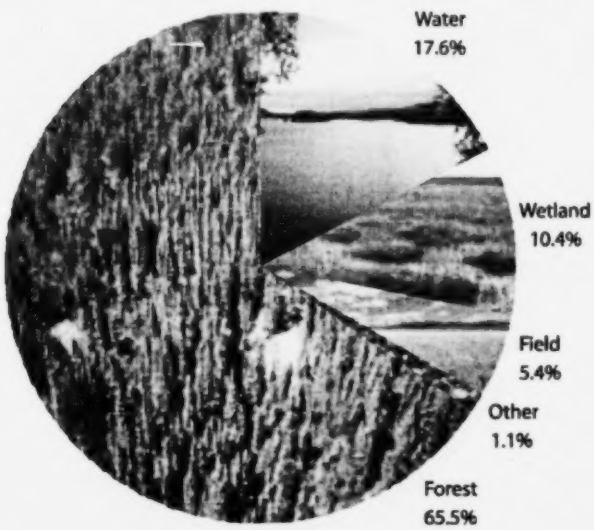
Chapter 2
Forests of Ontario



Throughout this document, Crown land refers to land owned by the province for the people of Ontario and, in general, is managed by the MNR. Statistics found in this chapter are from provincial inventories updated in 2001, and reflect changes resulting from Ontario's Living Legacy program. *The Forest Resources of Ontario 2001* should be consulted for a more complete description and summarization of the provincial inventories.

Ontario's 107.6 million hectare area is comprised of about 88.7 million hectares of land and 18.9 million hectares of water. Figure 2a illustrates the broad land classes in Ontario. Non-productive and productive forests comprise over 65 percent of the province. This is significantly higher than the comparable total for Canada, where forests represent only 42 percent of the country's area.

Figure 2a Land classes of Ontario



Three major ownership groups are described in this report - Crown, parks, and private or other owners. Seventy-nine percent of the province's area is Crown or publicly owned land and water. Provincial and national parks cover an additional eight percent, and privately-owned land and water encompasses the remaining 13 percent.

For forest management purposes, the province may be partitioned geographically, depending on the context. Subdivisions commonly referenced in this report include:

- Ecological Subdivisions
- Forest Regions
- Ecological Land Classification (ELC) System
- Administrative Subdivisions
- Management Zones
- MNR Administrative Regions and Districts
- Management Units

Ecological Subdivisions

Forest Regions of Ontario

Four major forest regions are represented in Ontario - the Deciduous Forest region in southern Ontario, the Great Lakes-St. Lawrence Forest region in southern and central Ontario, the Boreal Forest region in Northern Ontario, and the Hudson Bay Lowlands in the far north. Over 97 percent of Ontario's population lives within the Great Lakes-St. Lawrence and Deciduous Forest regions.

Each forest region is characterized by its own climate, forest ecosystems, and associated wildlife species. North-south shifts in temperature and east-west gradients in precipitation largely determine the extent of these forest regions. Broad zones of natural transition also occur between forest regions. As a result, certain tree species may appear in what seem to be inappropriate forest regions. For example, maple or white pine can be found within the southern reaches of the Boreal Forest.

A map of the forest regions of Ontario is shown in Figure 2b.

Figure 2c

The Hudson Bay Lowlands is a large, low-relief expanse of wetland, one of the largest in the world. With an area of 25.7 million hectares, it is comprised of both treed and open muskeg (74 percent), dotted with thousands of small lakes and ponds. Forest cover is less than 17 percent and is typified by stunted tamarack (also known as larch) and black spruce growing along riverbanks and other well-drained areas. The Hudson Bay Lowlands support a great variety of wildlife including polar bears, geese, and other animals normally associated with Arctic habitats. The Hudson Bay Lowlands are greatly affected by a cold northern climate, and contain all of Ontario's tundra. The region also contains Ontario's largest park, the 2.3 million hectare Polar Bear Provincial Park. Figure 2c shows an aerial view of a landscape typical of the Hudson Bay Lowlands.

- Ecological Subdivisions
- Forest Regions
- Ecological Land Classification (ELC) System
- Administrative Subdivisions
- Management Zones
- MNR Administrative Regions and Districts
- Management Units

Ecological Subdivisions

Forest Regions of Ontario

Four major forest regions are represented in Ontario - the Deciduous Forest region in southern Ontario, the Great Lakes-St. Lawrence Forest region in southern and central Ontario, the Boreal Forest region in Northern Ontario, and the Hudson Bay Lowlands in the far north. Over 97 percent of Ontario's population lives within the Great Lakes-St. Lawrence and Deciduous Forest regions.

Each forest region is characterized by its own climate, forest ecosystems, and associated wildlife species. North-south shifts in temperature and east-west gradients in precipitation largely determine the extent of these forest regions. Broad zones of natural transition also occur between forest regions. As a result, certain tree species may appear in what seem to be inappropriate forest regions. For example, maple or white pine can be found within the southern reaches of the Boreal Forest.

A map of the forest regions of Ontario is shown in Figure 2b.

The Hudson Bay Lowlands is a large, low-relief expanse of wetland, one of the largest in the world. With an area of 25.7 million hectares, it is comprised of both treed and open muskeg (74 percent), dotted with thousands of small lakes and ponds. Forest cover is less than 17 percent and is typified by stunted tamarack (also known as larch) and black spruce growing along riverbanks and other well-drained areas. The Hudson Bay Lowlands support a great variety of wildlife including polar bears, geese, and other animals normally associated with Arctic habitats. The Hudson Bay Lowlands are greatly affected by a cold northern climate, and contain all of Ontario's tundra. The region also contains Ontario's largest park, the 2.3 million hectare Polar Bear Provincial Park. Figure 2c shows an aerial view of a landscape typical of the Hudson Bay Lowlands.

Figure 2b Forest regions of Ontario.

Figure 2c Landscape typical of the Hudson Bay Lowlands.

The Boreal Forest is a world-wide band of conifer-dominated forest stretching across Scandinavia, Russia, Alaska, and northern Canada. In Ontario, the Boreal Forest region extends from the northern limits of the Great Lakes-St. Lawrence Forest to the Hudson Bay Lowlands. With an area of 49.8 million hectares, this forest region is, by far, the largest in the province. In the Boreal Forest, tree species are often associated with particular soil types and terrain conditions. For example, black spruce and tamarack are often found in poorly-drained areas, while trembling aspen, white birch, and jack pine grow on well-drained sites. Black spruce comprises 50 percent of all tree species in the Boreal Forest by growing stock volume.

The boreal softwoods (jack pine, black spruce, white spruce, balsam fir and tamarack) and intolerant hardwoods (trembling aspen, white birch, and balsam poplar) are generally even-aged in character. Boreal forests are characterized by natural disturbance, and are heavily influenced by the size, intensity, and frequency of fires that have burned across the landscape. Winds also affect forest conditions by blowing down trees or forest stands. Insects can defoliate large areas of forest. During the last 80 years, timber harvesting and forest fire suppression have affected the tree species mixture and age class structure of the Boreal Forest.

Figure 2d shows a typical jack pine stand found within the Boreal Forest.

The Great Lakes-St. Lawrence Forest region extends inland from the edges of the Great Lakes and the St. Lawrence River in central and southern Ontario. This forest region represents 20 percent of Ontario's actively managed Crown forest. The greatest concentrations of this forest type occur on the north and east shores of Lake Huron, in the Algonquin Park area, and in the Great Lakes-Boreal transitional zone that stretches from Thunder Bay to Fort Frances in northwestern Ontario.

Sugar maple, white pine, red pine, eastern white cedar, hemlock, tamarack, black spruce, white spruce, red oak, white oak, basswood, ash, poplar, yellow birch, and white birch are dominant species in this zone. Parts of this forest region have thin soils

Figure 2d Typical jack pine forest found within the Boreal Forest.

Figure 2e Typical maple forest found in the Great Lakes-St. Lawrence Forest.

over granite bedrock, while deep, well-drained soils are found elsewhere. The great diversity of sites and habitat in this region supports many wildlife species. Figure 2e illustrates a typical maple forest found in the Great Lakes-St. Lawrence Forest.

The Deciduous Forest is located in the southernmost part of Ontario, and is the only occurrence of this type of forest in Canada. Situated primarily in smaller pockets of forest on private land and within provincial parks on the north shore of Lake Erie, the Deciduous or Carolinian Forest region exists in the most densely populated area of Ontario. This region is now home to more than 25 percent of Canada's population, even though it covers less than one percent of the country's land mass. The region is over 3 million hectares in size, but less than 15 percent is forest. More than 75 percent of this region is agricultural land, while most of the remainder is urban. Forests in this region are now mostly found in locations with low agricultural potential, such as sand plains and bottomlands. These forest fragments have usually been greatly modified by human activities.

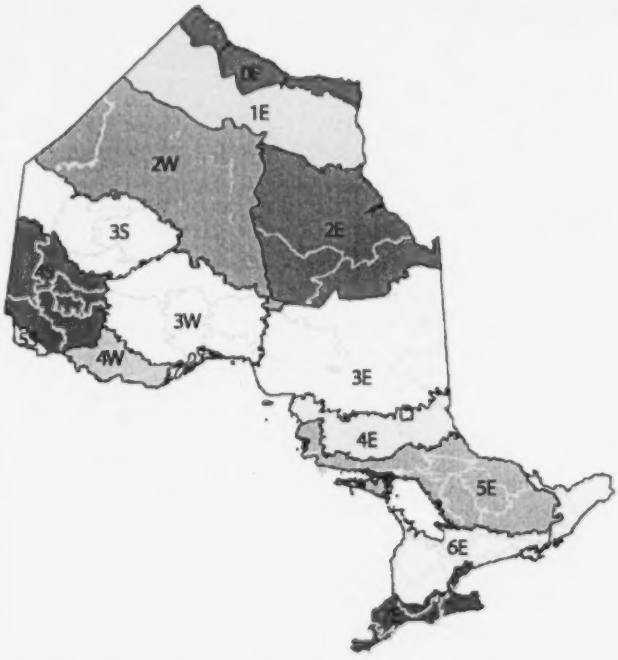
Surficial deposits ranging from gravel to clay cover the limestone bedrock that underlies the Deciduous Forest region. Maple, sassafras, walnut, and several varieties of oaks grow here. The Deciduous Forest region generally has the greatest diversity of tree species, while possessing the lowest proportion of forest in Ontario. With its rich forests and warm climate, several unique wildlife species, such as opossum and red-bellied woodpecker, also live here. Good examples of Deciduous Forest exist on Lake Erie's northern shore, in parks such as Wheatley, Rondeau, and Turkey Point. Figure 2f shows a multi-species hardwood forest typical of the Deciduous Forest region.

Ecological Land Classification System

The ELC system is a hierarchical and consistent framework for classifying landscape and site-level ecosystems formed by combinations of geologic, climatic, vegetative, soil, and landform features. At the broadest scales the ELC system is guided by a set of 14 ecoregions. Each ecoregion is further subdivided, resulting in a total of 71 ecodistricts across Ontario. A map illustrating the ecological regions of Ontario is shown in Figure 2g. For further details about the use and development of the ELC, see Chapter 10.

Figure 2f Multi-species hardwood forest typical of the Deciduous Forest region.

Figure 2g Ecological regions of Ontario



Administrative Subdivisions

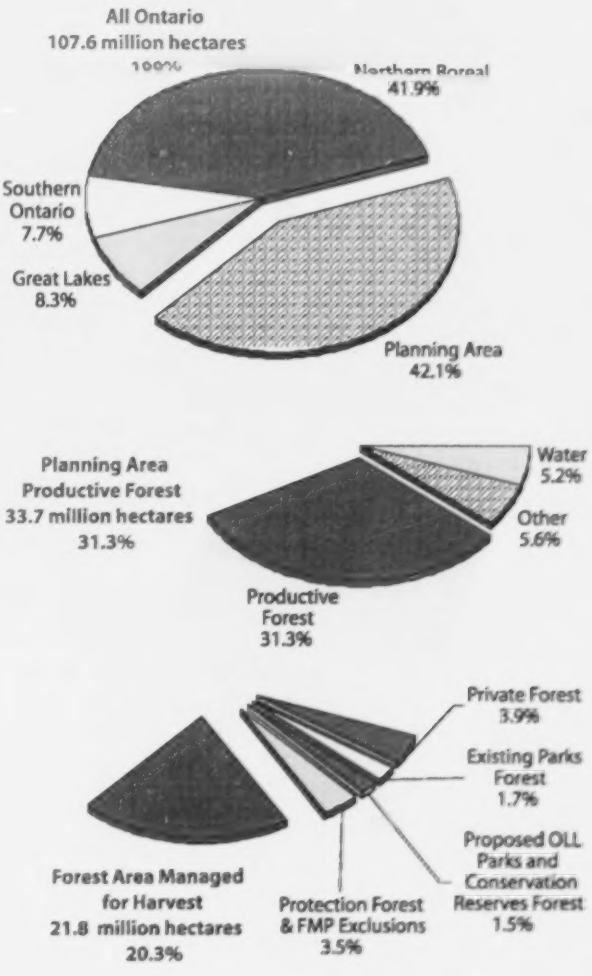
Management Zones

Ontario, comprised of 107.6 million hectares of land and water, is divided into three forest management zones (Figure 2h). The Northern Boreal Forest (41.9 percent of Ontario) describes the large expanse of Boreal Forest and Hudson Bay Lowlands in the far north. The Planning Area (42.1 percent of Ontario) refers to the middle zone where forest management planning and associated operations are currently carried out on Crown lands. Southern Ontario (7.7 percent of Ontario) is an area of mostly private land, where the majority of the population of Ontario lives. The Great Lakes make up the remaining 8.9 million hectares, or 8.3% of Ontario.

Productive forest on Crown land in the Planning Area covers about 33.7 million hectares, or 31.3% of Ontario. Within this area the forest area managed for harvest is limited to 21.8 million hectares, or 20.3 percent of Ontario (Figure 2i).

Figure 2h Forest management zones in Ontario.

Figure 2i Extent of the Planning Area.



The Planning Area referenced in this document is essentially the same as that area identified in *Ontario's Living Legacy – Land Use Strategy*. The context for this area was defined during the Ontario's Living Legacy (OLL) process, essentially starting with the Area of the Undertaking from the Timber Class EA approval, and adding the six large parks (totalling 2.1 million hectares) bordering this area - Woodland Caribou, Wabakimi, Quetico, and Lake Superior Provincial Parks, Pukaskwa National Park, and Michipicoten Island. Since the OLL process there has been a slight revision to this Planning Area,

over granite bedrock, while deep, well-drained soils are found elsewhere. The great diversity of sites and habitat in this region supports many wildlife species. Figure 2e illustrates a typical maple forest found in the Great Lakes-St. Lawrence Forest.

The Deciduous Forest is located in the southernmost part of Ontario, and is the only occurrence of this type of forest in Canada. Situated primarily in smaller pockets of forest on private land and within provincial parks on the north shore of Lake Erie, the Deciduous or Carolinian Forest region exists in the most densely populated area of Ontario. This region is now home to more than 25 percent of Canada's population, even though it covers less than one percent of the country's land mass. The region is over 3 million hectares in size, but less than 15 percent is forest. More than 75 percent of this region is agricultural land, while most of the remainder is urban. Forests in this region are now mostly found in locations with low agricultural potential, such as sand plains and bottomlands. These forest fragments have usually been greatly modified by human activities.

Surficial deposits ranging from gravel to clay cover the limestone bedrock that underlies the Deciduous Forest region. Maple, sassafras, walnut, and several varieties of oaks grow here. The Deciduous Forest region generally has the greatest diversity of tree species, while possessing the lowest proportion of forest in Ontario. With its rich forests and warm climate, several unique wildlife species, such as opossum and red-bellied woodpecker, also live here. Good examples of Deciduous Forest exist on Lake Erie's northern shore, in parks such as Wheatley, Rondeau, and Turkey Point. Figure 2f shows a multi-species hardwood forest typical of the Deciduous Forest region.

Ecological Land Classification System

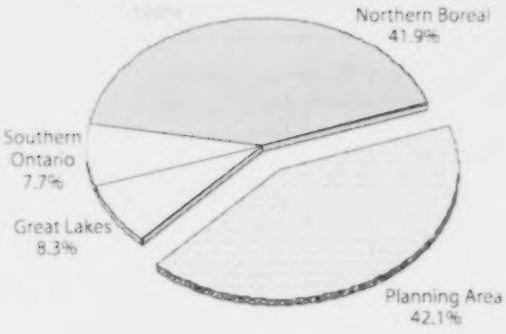
The ELC system is a hierarchical and consistent framework for classifying landscape and site-level ecosystems formed by combinations of geologic, climatic, vegetative, soil, and landform features. At the broadest scales the ELC system is guided by a set of 14 ecoregions. Each ecoregion is further subdivided, resulting in a total of 71 ecodistricts across Ontario. A map illustrating the ecological regions of Ontario is shown in Figure 2g. For further details about the use and development of the ELC, see Chapter 3.

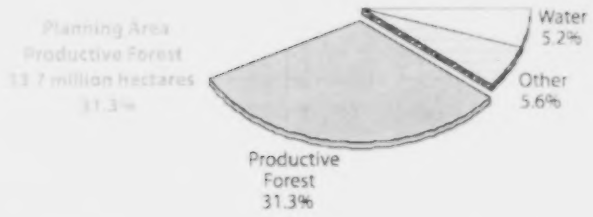
Administrative Subdivisions

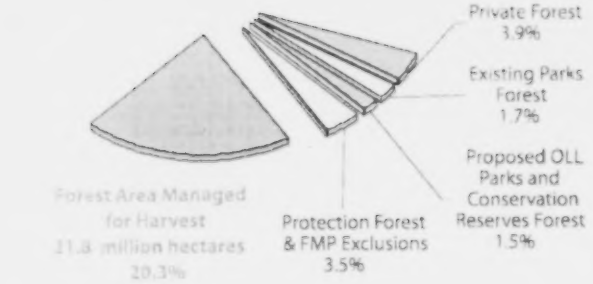
Management Zones

Ontario, comprised of 107.6 million hectares of land and water, is divided into three forest management zones (Figure 2h). The Northern Boreal Forest (41.9 percent of Ontario) describes the large expanse of Boreal Forest and Hudson Bay Lowlands in the far north. The Planning Area (42.1 percent of Ontario) refers to the middle zone where forest management planning and associated operations are currently carried out on Crown lands. Southern Ontario (7.7 percent of Ontario) is an area of mostly private land, where the majority of the population of Ontario lives. The Great Lakes make up the remaining 8.9 million hectares, or 8.3% of Ontario.

Productive forest on Crown land in the Planning Area covers about 33.7 million hectares, or 31.3% of Ontario. Within this area the forest area managed for harvest is limited to 21.8 million hectares, or 20.3 percent of Ontario (Figure 2i).







The Planning Area referenced in this document is essentially the same as that area identified in *Ontario's Living Legacy – Land Use Strategy*. The context for this area was defined during the Ontario's Living Legacy (OLL) process, essentially starting with the Area of the Undertaking from the Timber Class EA approval, and adding the six large parks (totalling 2.1 million hectares) bordering this area – Woodland Caribou, Wabakimi, Quetico, and Lake Superior Provincial Parks, Pukaskwa National Park, and Michipicoten Island. Since the OLL process there has been a slight revision to this Planning Area.

which now includes the remaining 135,000 hectares of Wabakimi Provincial Park.

The process of regulating the proposed parks and conservation reserves in the OLL project will occur over the next four years. Part of this process will involve resizing individual parks, as boundaries are refined and negotiated. Small increases and decreases will occur as part of this regulation process, while still maintaining the end objective of having 12 percent or more of the Planning Area designated as parks and protected areas.

Administrative Regions and Districts

MNR administrative boundaries are shown in Figure 2j. For administrative purposes, the province is divided by the MNR into three regions, each with a regional office - Northwest Region (Thunder Bay), Northeast Region (Timmins/South Porcupine), and Southcentral Region (Peterborough). These three regions are subdivided into a total of 26 MNR administrative districts, each with a designated local office. For the purpose of carrying out forest management activities, MNR districts are further divided into individual forest management units.

Figure 2j MNR administrative boundaries.

Management Units

MNR Regional Directors approve Forest Management Plans developed for management units, based on direction in the *Forest Management Planning Manual for Ontario's Crown Forests*. For a more complete explanation and listing of the management units in Ontario, see Chapter 3. A map of the management units in effect as of April 1, 2001 is provided in Appendix 1.

Ontario's Forest Inventory

For this annual report, the area of the province has been summarized using both Ontario Land Cover data and Forest Resources Inventory (FRI) data. These summaries are shown in Appendix 2, using a common set of land classes for the province as a whole, and two sub-categories of the entire province - the Planning Area and the inventoried area.

Ontario Land Cover Database

The Ontario Land Cover Database is the first land cover classification in Canada to be completed for an entire province wholly from satellite remote sensing data. The Ontario Land Cover data was derived from digital, multispectral LANDSAT Thematic Mapper data recorded on a range of dates between 1986 and 1997. The majority of the satellite data frames were recorded in the early 1990s. The forest cutovers and burns were updated from 1996 Thematic Mapper coverage for the Great Lakes-St. Lawrence Forest region and most of the Boreal Forest region. The total provincial area summarized using this coverage is shown in Appendix 2.

Forest Resources Inventory

Using aerial photographs and field verification, the FRI is created by classifying forest stands and other areas into broad physical categories including productive forest, non-productive forest, non-forested land, and bodies of water.

Each component is further classified by its ownership and land use. The FRI provides descriptive information in the form of interpreted aerial photographs, forest stand maps, and computerized data, used for management planning and to monitor the health of the forest.

A new inventory must be conducted on each management unit approximately every 25 years. Updates are required at the start of each new Forest Management Plan to reflect all changes to the forest (i.e., depletions and accruals) that occurred prior to the commencement of the new plan. Depletions include harvest and natural reductions, such as those caused by wildfire, insects, disease, and severe weather events. Accruals include the results of forest renewal and tending activities for both assisted and naturally regenerated areas.

FRI updates occur only within the Planning Area for use in Forest Management Plans. The average age of the FRI within the Planning Area is approximately seven years. Inventories of southern Ontario and the extreme north are now more than 20 years old. A vast area of the extreme north is not inventoried. For comparison purposes, FRI summaries for both the Planning Area and the inventoried area are included in Appendix 2.

Parks and Protected Areas

Ontario's Living Legacy

Announced on March 29, 1999, OLL represents a milestone in natural heritage protection, and provides a land-use strategy for 45 percent of the province. The strategy made a commitment to resource-based industries by providing greater long-term security for forestry and mining opportunities, and committed to the resource-based tourism industries by recognizing the need for certainty in their future. The strategy also committed to providing greater opportunities for outdoor recreational activities.

OLL was the result of Lands for Life, a large public consultation process launched by the MNR in 1997. The goals of that consultation were to:

- complete Ontario's system of parks and protected areas;

- recognize the land-use needs of the resource-based tourism industry;
- provide forest, mining, and other resource-based industries with greater certainty of land and resource use; and
- enhance angling, hunting, and other Crown land recreation opportunities.

THE ONTARIO FOREST ACCORD ADVISORY BOARD: ROOM TO GROW

The Ontario Forest Accord Advisory Board guided implementation of the Ontario Forest Accord - developing new tools, processes and principles to turn the Accord's 31 commitments into actions. In its final report, *Room to Grow: Final Report of the Ontario Forest Accord Advisory Board on Implementation of the Accord*, the Board:

- proposes a Room to Grow policy framework that designates how permanent increases in wood supplies will be shared between new parks and protected areas (to complete ecological representation) and more wood for the forest industry (to support jobs and growth);
- confirms that mitigation measures introduced since the Accord's signing have offset overall province-wide reductions in industry wood supply, caused by withdrawals from logging to create new parks and protected areas through Ontario's Living Legacy in March, 1999;
- provides an update on continuing progress on regulation of the Living Legacy parks and conservation reserves - 129 of 378 sites will be regulated by the end of March, 2002, with another 37 scheduled for regulation early in the new fiscal year, for a total of 166;
- proposes a methodology for identifying and assessing new candidate sites for parks and conservation reserves, to complete ecological representation in the Living Legacy Planning Area;
- supports public review of a discussion paper on Enhanced Forest Productivity, developed for the Provincial Forest Policy Committee, which includes proposals for implementation of Intensive Forest Management activities and use of pilot projects to test and refine Intensive Forest Management practices;
- recognizes the ongoing effort on several other Articles of the Accord, including consolidation and streamlining of the forest management guides by the MNR; and the Northern Boreal Initiative in the far north (roughly above the 51st parallel);
- recommends public consultations on this report, with particular emphasis on the proposed Room to Grow policy framework, the process for identifying new candidate sites, and enhanced forest productivity measures; and
- proposes an Action Plan for Operationalizing Com-mitments of the Ontario Forest Accord, including identification of work to be completed, designating lead responsibility, and how the Accord will continue to be implemented in day-to-day business.

Implementation of the commitments made in OLL began soon after the announcement of this unprecedented land-use planning exercise.

New Parks and Protected Areas

OLL established 378 new parks and protected areas, covering 2.4 million hectares, bringing the total area of provincial parks and protected areas in Ontario to 9.5 million hectares. These parks were created to represent natural heritage features and to protect the integrity of the ecosystems they encompass. The regulation of the 378 parks and protected areas is a very complex process and each site requires additional local consultation to finalize the boundaries. As of May 31, 2002, 129 sites had been regulated.

Ontario Forest Accord

The Ontario Forest Accord was signed in March 1999. It was an agreement between the environmental community, represented by the Partnership for Public Lands (a joint effort of the World Wildlife Fund Canada, the Federation of Ontario Naturalists and the Wildlands League), the forest industry and the MNR.

Through the Accord and its 31 Articles, the partners recognized the need to sustain the province's natural heritage, northern communities and the forest industry that provides economic development and jobs.

A tripartite body called the Ontario Forest Accord Advisory Board guided the collaborative implementation of the Accord. The Minister of Natural Resources asked the signatories to the Accord to act as members of the Board. The Board oversaw the implementation of the Accord - developing new tools, processes and principles to transform the Accord's 31 commitments into actions.

In April 2002, the Board submitted its final report *Room to Grow: Final Report of the Ontario Forest Accord on Implementation of the Accord* (Room to Grow). It reviews the progress of implementing the Accord and provides recommendations for further action. Many of these involve public consultation on policy proposals. Highlights are:

- A proposed Room to Grow framework identifying how permanent increases in wood supply will be shared between new protected areas and the forest industry;
- Confirmation that mitigation measures have addressed the impacts in wood supply resulting from the new OLL-protected areas;
- A proposed methodology for identifying candidate protected areas to complete representation;
- A recommendation for public consultation on the Board's final report, with particular emphasis on the proposed Room to Grow policy framework, the process for identifying new candidate sites and enhanced forest productivity measures;
- A recommendation supporting public review of a discussion paper on Enhanced Forest Productivity; and
- An action plan for operationalizing the Ontario Forest Accord commitments.

The release of the final report effectively drew to a close the Board's direct hands-on involvement in moving forward the Accord commitments. The Board proposed that should the Minister accept the report's recommendations, the operationalizing of the Accord will occur administratively as government guidelines, policies, procedures and regulations.

Private Woodlands

Ontario has 5.6 million hectares of productive forests under private ownership, 14 percent of the province's inventoried productive forest landbase. Approximately 95 percent (1.9 million hectares) of the productive forest south of the Planning Area is privately owned, while 11.1 percent (3.7 million hectares) of the productive forest in the Planning Area is privately owned. Private forests account for 13.5 percent of Ontario's growing stock, including almost one-half of the gross total volume of hard maple and "other hardwoods".

In 2001, annual returns from forest resource processing facilities indicated that eight percent of the gross total volume of conifers and 24 percent of the gross total volume of deciduous species processed originated from private woodlands. This represents 13 percent of the total volume processed. However, this does not fully recognize the contribution of Ontario's private woodlands to the provincial wood supply. Smaller facilities (processing less that 1,000 m3/year) are not required to be licensed or file annual returns. Wood transported from the province or that is not processed at a facility (e.g., fuelwood) is also not included. The total contribution of private woodlands could be greater than 15 percent.[2]

Private Land Initiatives

The ultimate decision of how private land in Ontario will be managed is made by the landowner. The *Private Woodlands Strategy* (1991) outlines how the MNR will encourage stewardship of this resource and provide a framework for sustainability by:

- co-ordinating the programs and efforts of the many agencies and groups interested in promoting stewardship;
- providing education and skill training opportunities for landowners to become more knowledgeable about stewardship;
- providing effective policies as incentive to foster stewardship of woodlands; and
- providing legislative support.

The MNR's private woodland initiatives encourage landowners to move towards the standard set by the definition of "good forestry practices" in the *Forestry Act* (1998):

> "...the proper implementation of harvest, renewal and maintenance activities known to be appropriate for the forest and environmental conditions under which they are being applied and that minimize detriments to forest values including significant ecosystems, important fish and wildlife habitat, soil and water quality and quantity, forest productivity and health and the aesthetics and recreational opportunities of the landscape..."

2001/02 initiatives supporting the stewardship of Ontario's private woodlands included:

[2] Source: 2001 Facility Annual Returns (not verified); volumes of whole tree chips (tonnes) converted to m3 with a 1.1 conversion; volumes received from "other facilities" not included

- The Managed Forest Tax Incentive Program which brings greater fairness to the property tax system by valuing eligible forest land according to its current use;
- Ontario Stewardship, a program that provides for local councils and that helps people find information, expertise, and funding to ensure that good management occurs on private land;
- Legislation enabling municipalities to develop and pass tree cutting bylaws that reflect local needs; and
- the Provincial Policy Statement which provides for the recognition of significant woodlands in municipalities south of the Canadian Shield

Managed Forest Tax Incentive Program

Property taxation policy needs to recognize, and encourage the long-term nature of investments in forest capital. In Ontario, investment in maintaining a healthy forest is encouraged through the Managed Forest Tax Incentive Program (MFTIP). In 1996, the government temporarily reintroduced the Managed Forest Tax Rebate Program, which rebated landowners a portion of their property taxes for being good stewards of their forest land. The new MFTIP was introduced for the 1998 tax year to bring greater fairness to the property tax system by valuing forestland according to its current use. The program is designed to increase landowner awareness about forest stewardship. Program participants range from landowners in Essex County looking after the fragmented natural landscape to large forest companies in Northern Ontario contributing to the northern economy.

Landowners who apply and qualify for the program have their property classified and assessed as Managed Forest under the Managed Forest property class. The land is then taxed at 25 percent of the municipal tax rate set for residential properties. Eligible properties must be over four hectares and have a Managed Forest Plan approved by a MNR-designated Managed Forest Plan Approver. The property remains eligible for the MFTIP as long as it is managed according to the approved plan. Plans must be renewed every five years.

The area covered by approved Managed Forest Plans indicates the program's success and, to some degree, the amount of private forests being sustainably managed. The goal is to ensure there is no long-term decline in the forest area included in the program.

In 2001, there were 611,575 hectares of land receiving benefits under the MFTIP (Table 2a). This is a decrease of 14,608 hectares (2.5 percent decrease) from the 2000 taxation year. The reduction is attributed to landowners leaving the program because of the requirement to update their Managed Forest Plan every five years. Many plans that entered the rebate program for the 1996 taxation year required significant enhancements to meet current program standards. In some cases, landowners determined there was insufficient benefit to update their plan to the new standards.

Table 2a Private forests managed under the Managed Forest Tax Incentive Program, by MNR region

	Forest Area Under Management (hectares)			Number of Properties		
MNR Region	1999	2000	2001	1999	2000	2001
Northeast Region	57,529	59,197	52,210	851	887	865
Northwest Region	179,612	181,019	180,206	90	105	115
Southcentral Region	353,830	385,967	379,157	7757	8,364	8,309
Total	590,971	626,183	611,575	8,698	9,356	9,289

Reporting date – July 31st of the year specified

Ontario Stewardship

Ontario Stewardship was initiated in 1995 by the MNR to encourage greater landowner involvement in stewardship activities. Ontario Stewardship helps people find information, expertise, and funding to

ensure good management occurs on private land. The program's strength lies in its stewardship councils, volunteer groups of landowners and land interest agencies. Each stewardship council works with a MNR stewardship co-ordinator. Many stewardship councils have representatives from forest interests and the forest industry. Each council is reflective of the landscape it serves. Councils discuss, develop, and deliver local programs and projects.

The MNR provides funding to each council to be invested in community level projects. This is often combined with funds from sources such as the Trillium Foundation, Human Resources Development Canada and various foundations. Volunteer hours are tracked and reported to show the total amount invested in private land stewardship. Examples of projects include workshops on woodlot and wetland management, stream restoration projects, endangered species conservation and community tree planting. For information on Ontario Stewardship, visit their website at: http://www.ontariostewardship.org.

The MNR maintains a central Stewardship Opportunity Fund that councils, in partnership with local or provincially-based groups, can access for assistance with activities that have impact at the landscape level. The MNR can influence activities by directing the fund to priority areas. For 2001/02, the priority areas for the Stewardship Fund were forestry and fish and wildlife projects. Examples of funded projects include the Provincial Demonstration Areas Catalogue and a service directory for Ontario's woodlot owners.

Table 2b reflects the value and contribution that Ontario Stewardship makes to natural resources in Ontario. Some projects are difficult to designate as forestry or fish and wildlife, and many include economic development and education components. Ontario Stewardship promotes networking, consensus building and community capacity building. These are the social aspects of the program that will enhance the sustainability of Ontario's private land resource.

ONTARIO STEWARDSHIP COUNCIL FOCUS: THE LENNOX AND ADDINGTON STEWARDSHIP COUNCIL

From Amherst Island in Lake Ontario to the wilderness of the Canadian Shield in the north, the Lennox and Addington Community Stewardship Council is committed to the care of the natural environment of the County. Council volunteers have a variety of backgrounds such as, agriculture, tourism, hunting, forestry and environmental education. The Council divides its activities and projects into four areas of emphasis: environmental education, watershed issues, wildlife habitat, and woodlot management.

There is increased pressure on private woodlands due to the high demand for hardwood logs and lumber. To help owners make informed decisions, the Council has developed a number of tools and products. One of the most innovative is the Upper Canada Woods Co-operative, which promotes sustainable forest practices, landowner and consumer education and local manufacturing of value-added products. Upper Canada Woods Co-operative members receive forest management, processing and marketing assistance. The Upper Canada Woods Co-operative currently encompasses over 5,000 acres. Partners in the development of the co-operative include the Ontario Woodlot Association, the Queen's School of Business and the Ministry of Agriculture and Food.

The Lennox and Addington Community Stewardship Council - caring for the land together. For more information, visit http://www.ontariostewardship.org.

Table 2b Summary of Ontario Stewardship accomplishments for 2001/02

Reporting Criteria	Measure
Council summary	
Number of stewardship councils	40
Number of council members (12/council)	480
MNR contribution ($10,000/council)	$400,000
Opportunity fund ($)	$105,000
Project summary (primary program area)	
Number of fish and wildlife projects	257
Number of forestry projects	215
Number of "other" projects	78
Total number of projects	550
Partner contributions to	
Number of volunteers	11,000
Number of volunteer hours	170,000
In-kind partner effort ($)	$6,500,000
Direct partner contributions ($)	$14,500,000
Total partner contributions (direct/indirect $)	**$21,000,000**

Tree Cutting Bylaws

Ontario municipalities have traditionally had the authority to regulate the harvest of trees on private land through various statutes. Counties, regional municipalities and a few specific townships in southern Ontario were first able to pass tree-cutting bylaws through the *Trees Conservation Act* in 1946, then the *Trees Act* in 1950, and finally the *Forestry Act* in 1998. Under the *Municipal Act* in 1994, all local municipalities with a population of greater than 10,000 could regulate tree cutting. Due to the population limit, bylaw provisions are not accessible to all municipalities. In particular, they do not apply to many northern Ontario communities.

To simplify the process and authority for tree-cutting bylaws, provisions are being consolidated into the new *Municipal Act, 2001*. This will enable upper-tier municipalities (counties and regional municipalities), lower tier municipalities (townships) and single tier municipalities to have equal access to tree-cutting bylaw powers. Provisions for tree-cutting bylaws remain in the Forestry Act or Municipal Act until the *Municipal Act, 2001* comes into effect. Table 2c lists the number of tree-cutting bylaws in Ontario and the act under which they were prepared.

Table 2c Number of municipalities with tree cutting bylaws in Ontario

MNR Region	Legislation	2000	2001
Southcentral	Forestry Act	23	24
	Municipal Act	15	16
Number of tree cutting bylaws in Ontario		**38**	**40**

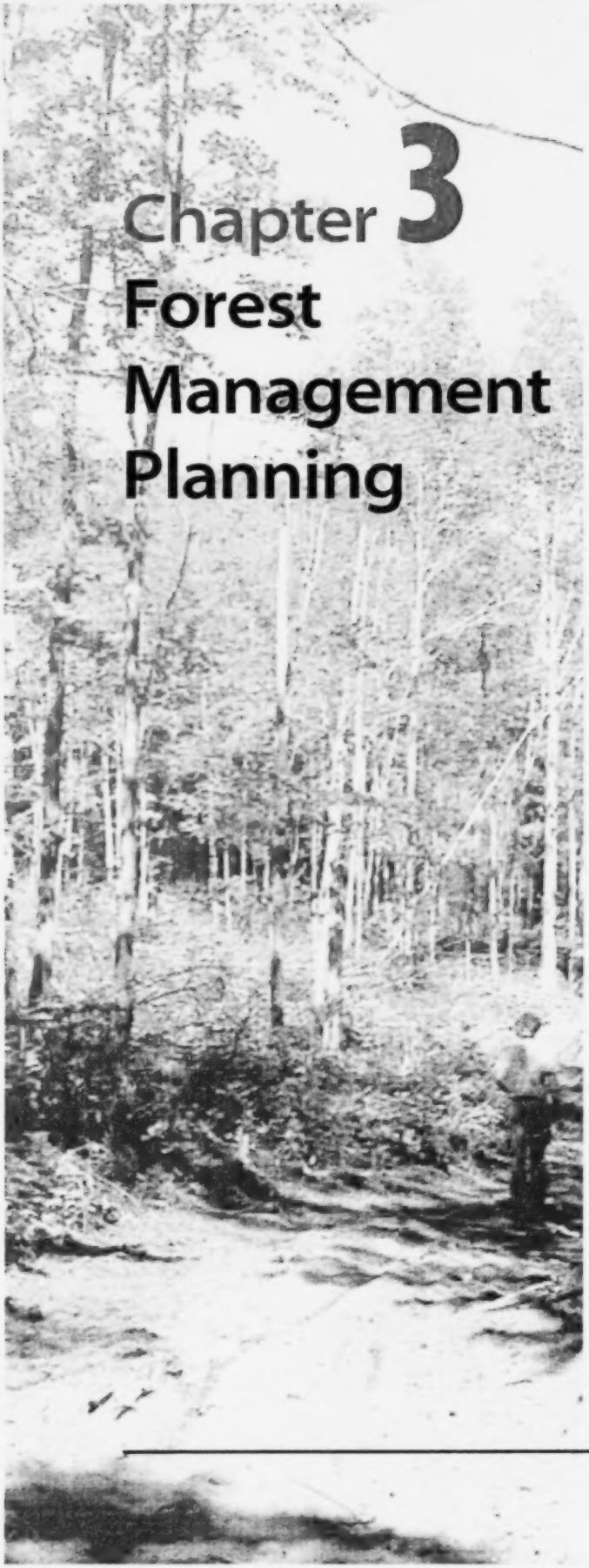
Significant Woodlands in the Provincial Policy Statement

The Provincial Policy Statement (1997), which includes provisions for significant woodlands, is issued under the authority of Section 3 of the *Planning Act*, which requires that in exercising any authority that affects planning matters, planning authorities "shall have regard to" policy statements issued under the Act. The Provincial Policy Statement indicates that development and site alteration may be permitted in significant woodlands south and east of the Canadian Shield, if it has been demonstrated there will be no negative impact on the natural features or ecological functions for which the area is identified. The MNR may provide expertise and technical support to municipalities in efforts to determine the significance of woodlands in their planning and development decision-making. Technical expertise and support are also provided to the Ministry of Municipal Affairs and Housing for its roles under the *Planning Act*.

Other Private Land Initiatives

The MNR supports other initiatives that provide assistance to Ontario's private land owners:

- The Extension Note series provides information in an easy-to-understand format on topics related to land, water, wildlife, trees and property management. The notes are on the Ontario Forests website (http://ontariosforests.mnr.gov.on.ca). Other publications, of a more technical nature, are also available to landowners.
- Through the Eastern Habitat Joint Venture Program, the MNR and partners actively conserve important wetland and upland habitats for the benefit of waterfowl, other wildlife and the public. Through this program, non-government partners offer technical and financial assistance to landowners for conservation projects.
- The Conservation Land Tax Incentive Program offers a reduction in property taxes to landowners agreeing to protect the natural heritage feature identified by the MNR on their property (e.g., provincially significant woodlands). For 2001, the program had over 14,000 properties participating, thereby conserving some of Ontario's most significant natural heritage features.
- The MNR promotes natural area protection through conservation easements under the *Conservation Land Act*. Easements may be entered into with a qualified organization and landowners can provide limits on land use. Since the easement is registered on title, it binds all owners of the land over the easement's term. The land may be devalued in dollar terms by the easement, which can lower property taxes.



Chapter 3
Forest Management Planning

Ontario's advanced forest management planning system includes a comprehensive planning process, extensive public consultation and detailed plan content requirements.

The *Crown Forest Sustainability Act,* in effect since 1995, stipulates that Ontario's Crown forests be managed to ensure they remain large, healthy, diverse, and productive. This legislation also includes specific requirements for forest management planning and the associated public consultation. Forest management planning rules have also been established under the *Environmental Assessment Act and* are reflected in the *Forest Management Planning Manual for Ontario's Crown Forests* (FMPM).

The FMPM provides detailed requirements for the planning process, the approach to public consultation and plan content. It also contains requirements for plan implementation, monitoring, reporting and evaluation.

Forest Management Plans (FMPs) are prepared for planning areas known as management units. In recent years, rationalization of management unit boundaries occurred to realize efficiencies in forest planning and plan implementation. As of April 1, 2001, the Area of the Undertaking was divided into 55 management units. The fifty-sixth management unit is comprised of all the pieces of Crown land in southern Ontario outside the Area of the Undertaking. There were 63 management units in place as of April 1, 2000. Further reduction in management units is expected to occur annually for several more years.

Appendix 1 contains a map of Ontario showing management units in effect for the year of this annual report. A corresponding list that identifies each management unit name, the status of the unit and the applicable MNR region is also included.

An approved FMP must be established before any forest operations are undertaken on a management unit. Each plan includes:

- an environmental, social, and economic description of the management unit
- long-term strategic direction including objectives and targets, an assessment of plan sustainability, the determination of areas eligible for operations during the 20-year period of the

plan, and the planning of primary access corridors for that time frame
- areas of operations including harvest, renewal and tending, and associated operational prescriptions for the first five-year term
- prescriptions for the protection of values, in or adjacent to areas of operations, such as fish and wildlife habitat, archaeological sites and tourism facilities
- primary and secondary access road corridors for the first five-year term
- a description of the program for monitoring forest management operations, and assessing renewal success, and
- supplementary documentation and a FMP summary

The process to prepare a FMP normally takes about 2.5 years to implement.

The MNR monitors plan implementation after approval, to ensure that it is followed. At the end of each year and following each five-year term, reports on plan implementation are prepared, including an assessment of forest sustainability after each five year term.

Appendix 3 provides a list of the 17 FMPs approved for implementation in 2001. In accordance with the requirements of the Timber Class EA approval, this appendix also includes the schedule of FMPs being prepared (as of January 2002) for implementation in 2002, 2003, and 2004.

Timber EA Renewal

The effective period of the approval for timber management activities under the *Environmental Assessment Act* covers nine years (1994 to 2003). Term and Condition #114 requires the MNR to undertake a comprehensive review of the forest management activities covered by the Timber Class EA approval and to submit a report containing its findings, including recommendations, for amending and extending the approval.

Under the Timber EA Renewal Project, efforts to prepare the report, initiated in 2000/2001, were continued in 2001/2002. These efforts included:
- launch of an Internet website
- establishment of a public advisory committee (a subcommittee of the Provincial Forest Policy Committee)
- preparation and release (for public comment) of a discussion paper presenting some key concepts
- information sessions in Dryden, Thunder Bay, Sault Ste. Marie, Timmins, North Bay, Peterborough and Guelph, to obtain public comment on the discussion paper, and
- MNR staff meeting with various stakeholders (e.g., the forest industry, environmental groups and government agencies)

Preparation of the report required under Term and Condition #114 began during the latter part of the year, with particular focus on the progress of the implementation of the existing Timber Class EA approval, and revised terms and conditions to be recommended by MNR.

Forest Management Planning Manual Revision

The FMPM Revision Project was initiated in June 2001, following the completion of the Forest Management Planning Improvement Project. The Timber EA Renewal Project was also progressing during this period and linked to the ongoing work on the FMPM Revision Project. The principal accomplishment during 2001/2002 was the establishment of several focus groups to answer specific questions of a technical nature that were not resolved by the Forest Management Planning Improvement Project. Individual focus groups dealt with some specific questions related to the following broad topics: plan term; strategic direction; harvest planning; roads planning; Aboriginal consultation; and, public consultation. In addition, a writing team was formed to begin the actual work on proposed revisions to the FMPM.

Forest Information Manual

The *Forest Information Manual* describes the requirements for exchanging information about the management of Crown forests between the forest industry and the MNR. This manual was approved into regulation on April 25, 2001.

The *Forest Information Manual* identifies the requirements and standards for information such as:

- Forest Resources Inventory
- maps
- annual reports
- values
- silvicultural effectiveness monitoring
- forest operations prescriptions
- forest compliance inspections
- geographic base data (water/lakes and rivers, ownership and land tenure, parks and reserves, transportation routes/roads, designated management units, etc.)

These information products are required to support the purposes of forest management planning as outlined in the FMPM. The *Forest Information Manual* also sets out the direction for copyright and ownership of information prescribed by the manual, which is consistent with existing legislation concerning copyright, intellectual property and access to information. The *Forest Information Manual* maintains the MNR's ability to ensure that the public is provided with access to information about the management of Ontario's Crown forests.

The *Forest Information Manual* focuses on the need for exchanging digital information (i.e., data in its raw form). This is a considerable challenge, since both the forest industry and the MNR maintain and use different information systems and database structures, and organize their information and data in different ways. Therefore, an objective of this manual is to improve the exchange of quality information in a consistent and standardized form. Given this challenge, the exchange of standardized digital information will require a transition period in order to synchronize forest industry and government information systems. The exchange of information between the MNR and the forest industry has improved considerably since the regulation of The *Forest Information Manual.*

Chapter 4
Forest Industry and Government Revenue

Ontario's Crown forests provide numerous opportunities and benefits, for recreation, tourism, hunting, trapping, fishing, and food production. For example, millions of Ontario residents reported participation in various forest-based leisure activities in 2002 (Table 4a).

Many Aboriginal communities in Ontario are situated in a forest environments, and these communities often make extensive use of the forest. Opportunities for Aboriginal peoples to have more equal participation in the benefits of forest management are discussed in Chapter 9.

Ontario's forests also supply the basic resources for a variety of industries, including lumber, structural board, pulp, paper, and newsprint. In addition, facilities that support forest activities and numerous service industries also depend on Crown forests. While there are many users of the forests of Ontario, this chapter focuses on the forest industry, and the revenues provided by the forest industry to the government of Ontario.

Forest Products Industry

The logging, wood products manufacturing and paper manufacturing sectors, plus other related industries, comprise the forest products industry. The logging industry includes both large and small contractors, as well as large, mill-owned operations. The contractors may work independently or directly for company-owned mills.

The wood products manufacturing industries include businesses such as sawmills, veneer mills, and structural board and lumber plants producing construction materials and specialty wood products. The capital investments in these facilities range from a few thousand dollars to over $250 million dollars.

Pulp and paper mills are the largest types of plants for converting timber fibre to forest products. A greenfield pulp mill can cost close to $1 billion. Their output represents almost 60 percent of the value of all forest product shipments.

Table 4a Persons participating in forest-based leisure activity in Ontario

	Persons Participating in Ontario				
Leisure Activity	1998	1999	2000	2001	2002
Bird Watching	1,120,000	1,049,000	1,019,000	977,000	1,003,000
Canoeing	1,236,000	1,210,000	1,257,000	1,154,000	1,220,000
Cross-Country Skiing	749,000	626,000	609,000	477,000	505,000
Fishing	1,814,000	1,699,000	1,632,000	1,498,000	1,650,000
Hunting	493,000	502,000	479,000	417,000	459,000
Mountain Biking	n/a	n/a	n/a	667,000	679,000
Snowmobiling	554,000	583,000	620,000	450,000	470,000
Walking/Hiking	4,299,000	4,320,000	4,406,000	3,962,000	4,143,000

Source: Print Measurement Bureau 1998-2002 Readership Surveys

The value of sales from Ontario's forest products sector reached almost $19 billion in 2001.[3] Table 4b shows the value of sales (shipments) in this sector for the five-year period ending in 2001.

Table 4b Ontario forest products sector sales

Year	Value of Shipments (million $)
1996	$14,348
1997	$14,728
1998	$15,226
1999	$15,849
2000	$18,709[1]

[1] The logging component of the year 2000 total was not available, and was estimated using 1999 values

Source: Statistics Canada 2000

Value added, the amount the industry actually contributes to the Ontario gross provincial product (this eliminates the double counting effect of sales between the forest pro-duct manufacturers and their suppliers), rose to $6.7 billion, an increase of 3.8 percent from the year before. Table 4c shows the value added for the logging industry and both major forest sector industries - the wood product industries, and the paper and allied industries.

Employment within the forest industry in 2000 was 275,000[4]. Included in this figure are direct, indirect, and induced jobs. Table 4c below shows direct employment only.[5]

As well as being a major employer, the forest industry annually invests in capital improvements and mill expansions. In 2000, the forest industry had capital and repair expenditures of $1.5 billion. In 2001 these expenditures fell to $1.3 billion.

Table 4c Distribution of manufacturing activities by sector and direct employment within each sector

	Number of Establishments		Number of Employees		Total Value Added	
Sector	Number	% of Canadian Total	Number	% of Canadian Total	Value Added (million $)	% of Canadian Total
Logging	n/a	n/a	5,000	9%	$553	12%
Wood Product Manufacturing	922	25%	36,000	22%	$2,134	17%
Paper Manufacturing	396	45%	43,000	39%	$4,014	29%
Total	**1,318**	**20%**	**84,000**	**22%**	**$6,701**	**22%**

Source: Statistics Canada 2000

[3] In 2000 major conceptual and methodological changes occurred in the Annual Survey of Manufacturers, therefore statistics for 2000 and 2001 cannot be compared to previous years.

[4] StatsCan and MNR's Socio-Economic Impact Model

[5] Statistics Canada Labour Force Survey is using a new Standard Industrial Classification system which renders direct comparisons with previous years inappropriate.

Forest Sector Employment

Based on the 2001 Statistics Canada census, 28 Ontario communities, mostly located in Northern Ontario, had at least 20 percent of their labour force employed in the forest industry. Appendix 4 lists these Ontario communities, shows the total labour force for each community, and identifies the percentage that worked in the forest sector.

Harvest Licence System

The vast majority of Ontario's forests are harvested by companies or individual operators that hold one of two types of licences - Sustainable Forest Licences (SFLs) and Forest Resource Licences (FRLs). The total land under both licence types is shown in Table 4d. Many FRLs and salvage licences are issued on existing SFLs, and are listed in the overlapping licence column. Note that the total productive forest licensed area includes areas excluded from normal harvesting activities, such as protection forest and areas of identified wildlife, Aboriginal and cultural values.

Table 4d Crown production forest area under licence in 2001/02, by licence type

Licence Type	Number of Licences	Licensed Productive Forest Area (ha) Overlapping	Not Overlapping
Sustainable Forest Licence	50	—	25,451,720
FRL < 300 hectares	2,230	79,861	18,872
FRL > 300 hectares	949	83,226	5,026
FRL Salvage	99	1,857	29,840
Total	**3,328**	**164,944**	**25,505,458**

Among other requirements, a SFL requires the licensee to prepare forest management plans following the direction of the *Forest Management Planning Manual for Ontario's Crown Forests*. The licensee is responsible for implementing forest management plans by carrying out access, harvest, renewal, and maintenance activities. The SFL holder must follow the rules and guidelines set by the MNR to ensure sustainable forest management. FRL holders follow forest management plans approved by the MNR and must operate to ensure the long-term health of the forest. For further details on Ontario's forest management planning system, see Chapter 3.

Resource Stewardship Agreements

Resource Stewardship Agreements (RSAs) are a means for SFLs and licensed tourism establishments, two key forest users, to collaborate on the development of planning solutions proposed during the forest management planning process. The *Tourism and Forestry Industry Memorandum of Understanding* (2001) provides direction for the development of these RSAs. The Memorandum of Understanding recognizes the value of two industries working co-operatively to understand each other's needs and of working together in the development of planning proposals. While this co-operative approach to planning has been used in some parts of Ontario for the past 10 or more years, the Memorandum of Understanding commits the industries and government to support use of the process everywhere in the Crown forest. Use of the RSA process is intended to provide greater security for the two industries and help them avoid costly and time-consuming forest management conflicts.

Issues commonly addressed in RSAs include access road use controls, viewscape protection and timing restrictions on forest operations. Signed RSAs are expected in the 2002/03 fiscal year.

Ontario's Stumpage System

In 2001/02, the Government of Ontario received direct payments from the forest industry in the form of stumpage fees, and indirect revenue from taxes.

Forest companies pay a stumpage fee to the Crown for every cubic metre of timber harvested. A market-based pricing system is used by the MNR to calculate the stumpage fees companies and individuals pay for harvesting timber from Crown land. In

times of strong market prices for forest products, the stumpage system triggers higher fees. In poor markets, harvesters pay lower fees.

The Crown's stumpage fees have three components:

- A minimum charge per cubic metre of harvested timber, regardless of the species, goes to the Consolidated Revenue Fund of the province. This charge is adjusted annually. Table 4e shows the changes in the minimum charge since 1997.
- A forest renewal levy to provide dedicated funding for forest renewal. This charge varies depending upon the tree species and its anticipated renewal cost. Forest renewal charges are held in either a Forest Renewal Trust Fund or a Forest Renewal Special Purpose Account and can only be used for regenerating and maintaining the health of Ontario's forests.
- A residual value charge, paid to the province's consolidated revenues by forest companies or individuals licensed to harvest timber. The calculation of this charge varies from zero in times of low forest product prices to about $20 per cubic metre when product prices are high.

The forest industry also contributes to the Forestry Futures Trust Fund through a $0.48 charge per cubic metre of timber harvested. The Forestry Futures Trust is managed by an independent Crown committee. It funds projects that meet MNR-approved criteria. To qualify, projects must be: a silvicultural activity on Crown land that addresses renewal of trees killed or damaged by fire; renewal of land where a licensee becomes insolvent; forest protection from insect or disease infestation; intensive stand management related to a critical wood supply; or, expenditures for Independent Forest Audits, Forest Resource Inventories, or conversion charges[6].

Table 4f shows the direct payments from the forest industry to the various government accounts during the last five fiscal years. The Forest Renewal Special Purpose Account will be phased out when all Crown management units, currently under direct management by the MNR, are converted to SFLs.

Table 4e Minimum stumpage charge per cubic metre

Fiscal Year	Minimum Charge
1997/98	$2.84
1998/99	$2.85
1999/00	$3.23
2000/01	$3.28
2001/02	$3.40

Table 4f Crown charge payments by the forest industry

Year	Forestry Futures Trust	Consolidated Revenue Fund	Forest Renewal Trust	Forest Renewal SPA[f]	Total Payments
1997/98	$10,576,700[a]	$178,063,200	$52,373,500	$44,159,000	**$285,172,400**
1998/99	$20,605,300[b]	$157,452,300	$71,298,900	$28,930,800	**$278,287,300**
1999/00	$10,050,700[c]	$155,695,700	$78,668,100	$5,147,900	**$249,562,400**
2000/01	$11,180,600[d]	$105,191,500	$83,893,900	$2,306,800	**$202,572,800**
2001/02	$11,087,400[e]	$90,159,925	$67,363,300	$2,613,700	**$171,224,325**

[a] Includes conversion funds of $4,428,900 collected in 1997/98
[b] Includes conversion funds of $8,418,167 collected in 1998/99
[c] Includes conversion funds of $1,640,892 collected in 1999/00
[d] Conversion funds were not collected in 2000/01
[e] Includes conversion funds of $100,349
[f] Amounts are as of March 31, 2002.

Note: Funds in the Forest Renewal Trust, the Forest Renewal Special Purpose Account, and the Forestry Futures Trust are not formally counted as revenue by the province, although funds in the Forest Renewal Special Purpose Account are held in the province's Consolidated Revenue Fund.

[6] Conversion charges are used to assist new, smaller SFLs with costs associated with the establishment of an SFL (e.g., inventory).

Chapter 5
Forest Access Roads

Most forest access roads on Crown land are planned, constructed, and paid for by the forest industry. The Forest Management Plan for each management unit describes the location, construction, maintenance, and use management of access roads that exist, or are planned for construction. These roads are essential for performing forest management activities. They also provide public access to provincial Crown land for tourism, outdoor recreation, mining, and other activities.

This report provides information on the construction of primary and secondary forest access roads. It describes road maintenance activities, including grading, snow plowing, realignments, flood repairs, bridge repairs, and any other activity necessary to maintain existing roads. This chapter also reports on controlling access to roads, implementation of abandonment measures, and how this work is funded.

Road Construction and Maintenance

Figure 5a shows provincial road construction from 1997/98 through 2001/02 for primary and secondary forest access roads, and for each MNR region for 2001/02. Total primary and secondary road construction for 2001/02 amounted to 617 kilometres, a decrease from the 2000/01 construction total of 739 kilometres. There were 136 kilometres of primary roads constructed in the province and 482 kilometres of secondary roads in 2001/02. Slightly more than one-half of the forest access road construction occurred in Northeast Region, and the remainder in Northwest Region. There was no reported road construction in Southcentral Region in 2001/02.

Figure 5b shows total provincial road maintenance from 1997/98 through 2001/02 for primary and secondary forest access roads, and for each MNR region for 2001/02. Total road maintenance for the year was carried out on 17,320 kilometres of primary and secondary roads. This is a slight decrease over the 2000/01 total of 17,489 kilometres of road maintenance. Approximately 54 percent of the road maintenance in 2001/02 occurred in the Northeast Region,

Figure 5a Road construction by road class and MNR region

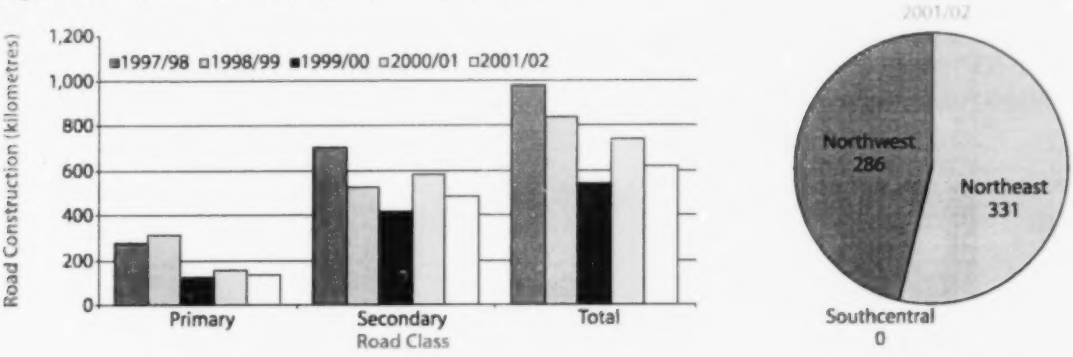
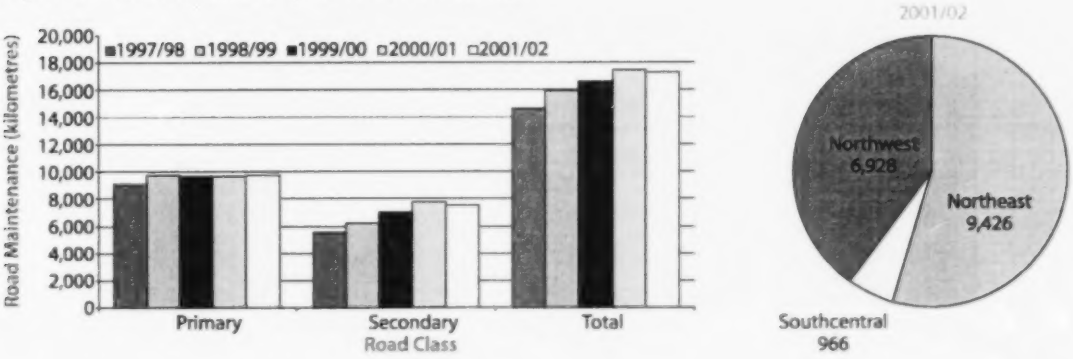


Figure 5b Road maintenance by road class and MNR region



ROAD CLASSES

PRIMARY ROADS

Essentially permanent roads. They are regularly maintained with a life expectancy in excess of 15 years.

SECONDARY ROADS

Essentially branches off primary roads. They are not considered permanent and are not normally maintained beyond their five to fifteen year period of use.

TERTIARY ROADS

Built for short-term use (i.e., up to five years). They are not normally maintained beyond their period of use.

with 40 percent in Northwest Region and approximately six percent carried out in Southcentral Region.

In 2001/02 the Forest Access Road Program, funded by the MNR and the Ministry of Northern Development and Mines, invested $4.58 million in the reconstruction and maintenance of forest access roads in Northern Ontario. Most of the roads funded by the two ministries serve several purposes, including public access and forest management.

Road Access Control and Abandonment

Road access control and abandonment must be planned in advance of construction, and documented in the Forest Management Plan for each management unit. These activities must also be reported in the management unit annual report.

For reasons of public safety and/or resource management, forest access roads may be closed to certain uses on a temporary, seasonal, or permanent basis. Methods used to control access can generally be classified into two categories: erecting signs to advise the public of the restriction (referred to as signage); or, installing gates or using other physical means such as ditching (referred to as gated or physical barrier).

Figure 5c shows the length of primary and secondary forest roads that had controlled access from1997/98 through 2001/02. In 2001/02 a total of 3,835 kilometres of road had access controls, continuing the trend of the previous four years of increasing controlled access. There were 1,286 kilometres of controlled access roads in the Northwest Region, 1,890 kilometres in the Northeast Region and 659 kilometres in the Southcentral Region. Provincially, access was restricted on 1,121 kilometres of road by gating and on 1,705 kilometres of road by signage. Another 1,009 kilometres of road had access control through unspecified means, and are shown in the "other" category in Figure 5c.

Figure 5d shows the total length of primary and secondary forest access roads that were abandoned from 1997/98 through 2001/02. Almost 600 kilometres of road were abandoned in 2001/02, a significant increase from the previous year. This total included 238 kilometres in the Northwest Region, 350 kilometres in the Northeast Region, and only 10 kilometres in Southcentral Region. The majority of these roads were abandoned naturally .

Figure 5c Road access control by control method and MNR region.

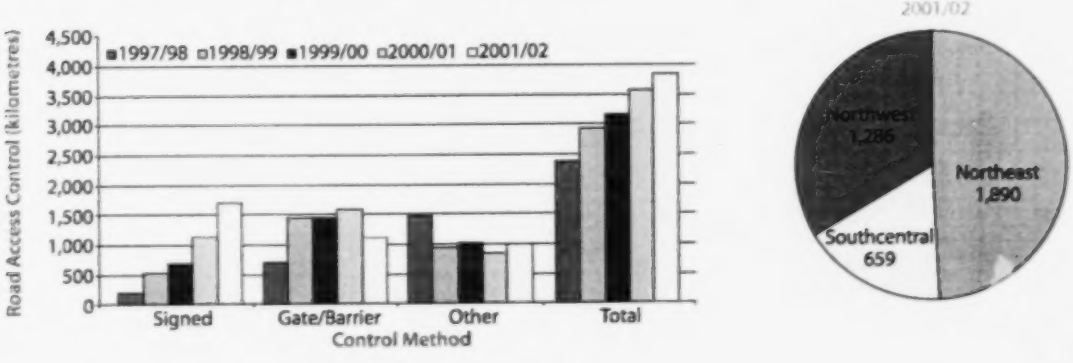
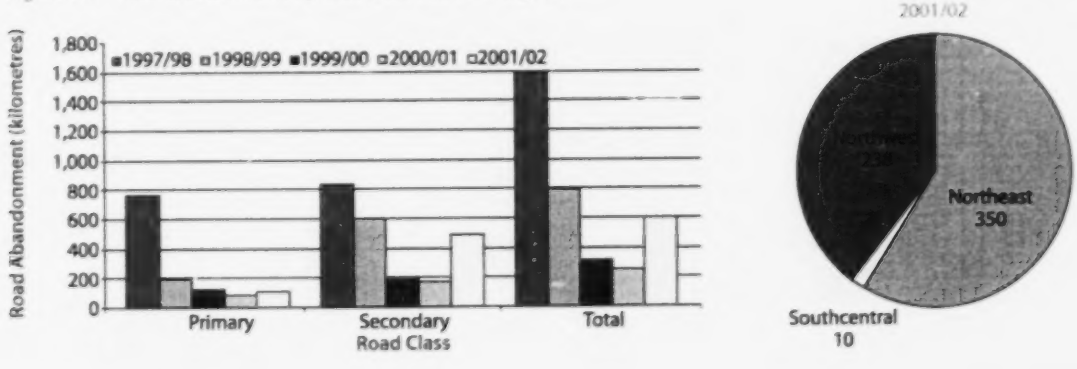
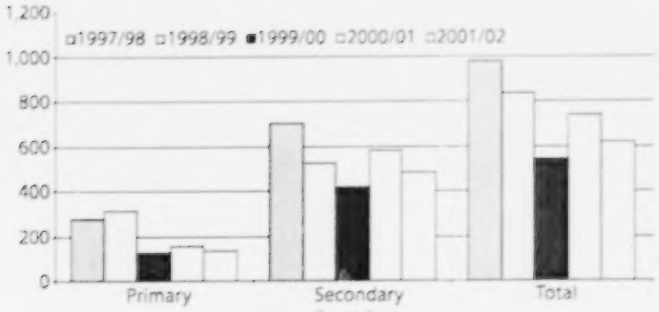
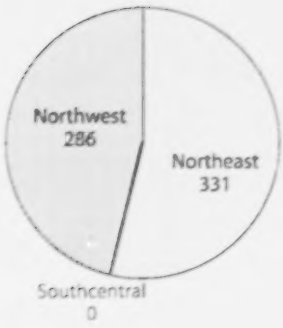
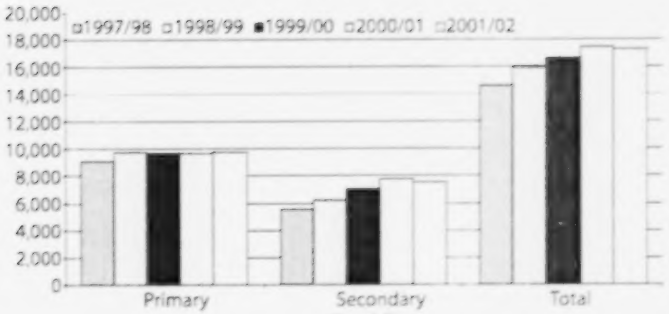


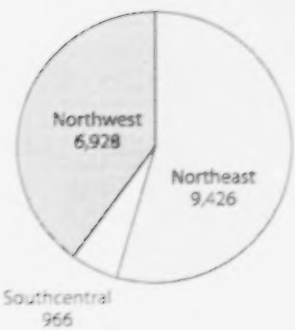
Figure 5d Road abandonment by road class and MNR region.











with 40 percent in Northwest Region and approximately six percent carried out in Southcentral Region.

In 2001/02 the Forest Access Road Program, funded by the MNR and the Ministry of Northern Development and Mines, invested $4.38 million in the reconstruction and maintenance of forest access roads in Northern Ontario. Most of the roads funded by the two ministries serve several purposes, including public access and forest management.

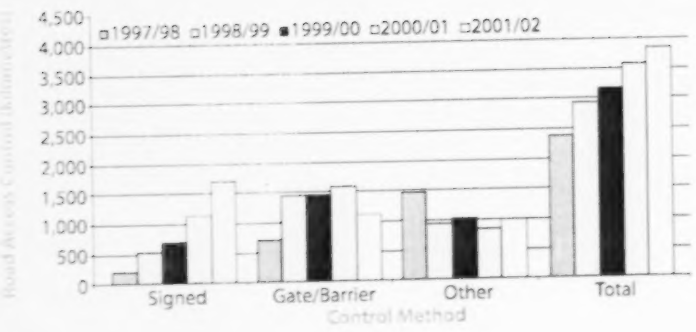
Road Access Control and Abandonment

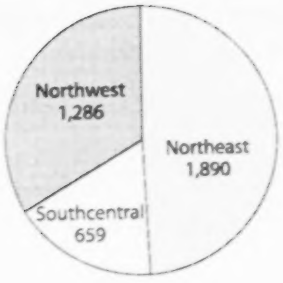
Road access control and abandonment must be planned in advance of construction, and documented in the Forest Management Plan for each management unit. These activities must also be reported in the management unit annual report.

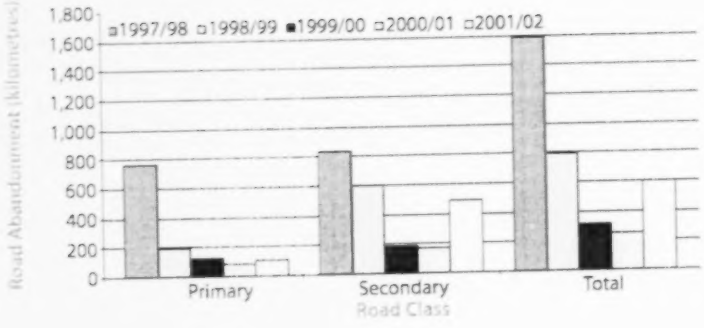
For reasons of public safety and/or resource management, forest access roads may be closed to certain uses on a temporary, seasonal, or permanent basis. Methods used to control access can generally be classified into two categories: erecting signs to advise the public of the restriction (referred to as signage); or, installing gates or using other physical means such as ditching (referred to as gated or physical barrier).

Figure 5c shows the length of primary and secondary forest roads that had controlled access from 1997/98 through 2001/02. In 2001/02 a total of 3,835 kilometres of road had access controls, continuing the trend of the previous four years of increasing controlled access. There were 1,286 kilometres of controlled access roads in the Northwest Region, 1,890 kilometres in the Northeast Region and 659 kilometres in the Southcentral Region. Provincially, access was restricted on 1,121 kilometres of road by gating and on 1,705 kilometres of road by signage. Another 1,009 kilometres of road had access control through unspecified means, and are shown in the "other" category in Figure 5c.

Figure 5d shows the total length of primary and secondary forest access roads that were abandoned from 1997/98 through 2001/02. Almost 600 kilometres of road were abandoned in 2001/02, a significant increase from the previous year. This total included 238 kilometres in the Northwest Region, 350 kilometres in the Northeast Region, and only 10 kilometres in Southcentral Region. The majority of these roads were abandoned naturally .







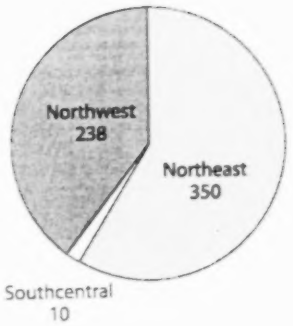
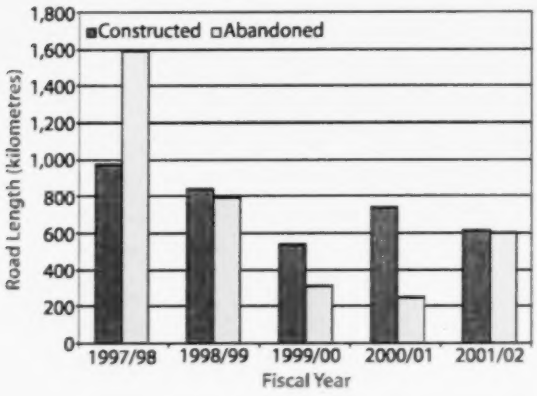


Figure 5e shows a comparison of total provincial forest access road construction and abandonment over the last 5 years. During this time 3711 kilometres of access road have been constructed, and 3553 kilometres have been abandoned.

Figure 5e Road construction and abandonment



ACCESS CONTROL

The closure of a road to public travel or the restricted access to a road for certain specified uses for given periods of time.

ROAD ABANDONMENT

The use management strategy adopted when a road has fulfilled its original use and is no longer required, or when maintenance cannot be justified.

NATURAL ABANDONMENT

The natural degradation of a road when it is not maintained. Road maintenance has ceased and steps are not taken to prevent the use of the road by vehicular traffic through means of physical disablement.

PHYSICAL ABANDONMENT

A deliberate act to render a road unusable by vehicular traffic. For example: gating, ditching, bridge or culvert removal.

Chapter 6
Forest Disturbance and Harvest

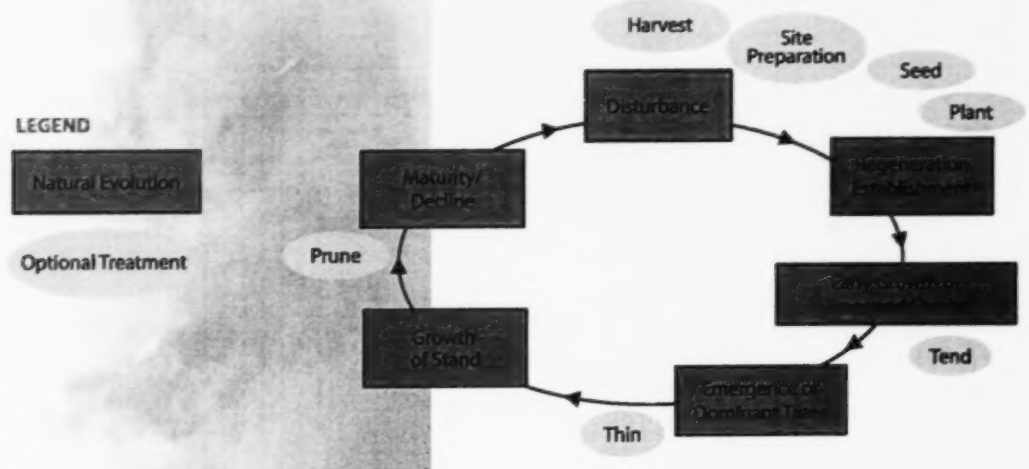
Natural disturbances such as insects, diseases, severe weather events and forest fires occur throughout the life cycle of the forest, as illustrated in Figure 6a.

Forest disturbances (except for diseases) are measured both by area (hectares) and volume (cubic metres) of trees killed, damaged, or harvested. Losses to tree diseases are normally chronic, and are estimated by calculating an annual average volume loss for all chronic diseases. Area affected is not recorded for chronic diseases.

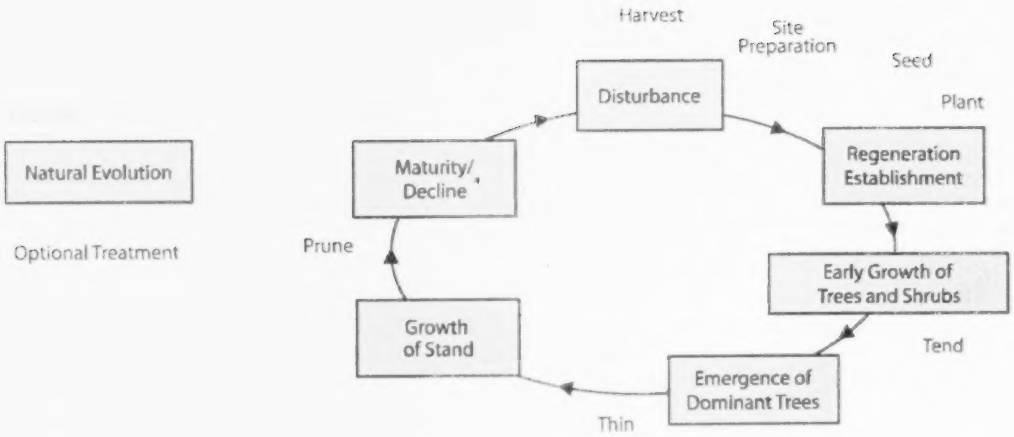
All estimates of disturbance area, both for the province and for the Area of the Undertaking (AOU), encompass all forest lands, including Crown forests, federal and private forest lands, and federal and provincial parks. Estimates for AOU disturbance volume, however, are based on Crown production forest lands only.

Forest inventory descriptions are changed when stands are impacted by disturbance. However, the degree of disturbance impact required before the inventory description is changed is a subjective decision. The most significant disturbances are reported in the fall of the year following a disturbance. Many disturbances reported in this 2001/02 report actually occurred during 2000/01. Reporting is delayed to allow time to completely map and inventory all disturbances that occurred during a given year.

Figure 6a The forest life cycle



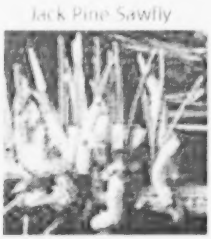
Forest Disturbance and Harvest



Armillaria Root Rot

Serpentine Leaf Miner

Leaf Miner


Jack Pine Sawfly

Forest Tent Caterpillar

Natural Disturbances

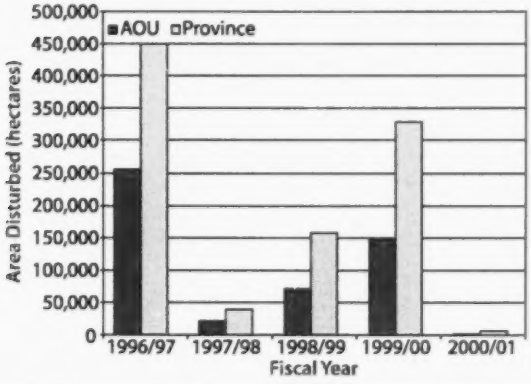
Natural disturbances include fire disturbances, and damage from insects, disease, and severe weather conditions. The intensity of these disturbances varies annually.

Forest Fires

The MNR records the area disturbed by forest fires across all the forested area of Ontario.

Area The number and size of forest fires varies dramatically year to year, depending on the weather. This variability is particularly noted in Figure 6b, where the last five years of provincial fire disturbance are shown. During the period 1996/97 to 2000/01, provincial annual fire disturbance was highest in 1996/97 at approximately 450,000 hectares of forest burned. Within the AOU that year 256,000 hectares burned. The smallest annual area disturbed by fire in the period occurred in 2000/01, when only 6,647 hectares were burned provincially (1,712 hectares in the AOU).

Figure 6b Area disturbed by forest fire



AOU Volume Estimated total wood volume lost to forest fires in the AOU from 1996/97 through 2000/01 is shown in Table 6a. The trend in this table is similar to the trend in area burned. The highest volume lost to fire in the AOU during this period occurred in 1996/97 at over 41 million cubic metres, and the lowest volume burned, 413 thousand cubic metres, occurred in 2000/01.

Table 6a Estimated wood volumes lost to forest fires within the AOU

Disturbance Type	Volume Loss (cubic metres) 1996/97	1997/98	1998/99	1999/00	2000/01
Wildfire	41,605,140	1,804,050	7,310,830	12,790,670	413,050

Depending on the severity of the damage to trees from fire, it is often possible to conduct salvage activities in burned areas to harvest dead or damaged trees. These operations are reported as harvesting, and discussed later in this chapter.

Insects, Disease, Severe Weather

Estimates of area affected and wood volumes lost from 1996/97 through 2000/01 due to insects, disease, and severe weather are based on studies completed by the Forest Health Monitoring partnership between the Canadian Forest Service and MNR. Depending on the severity of damage to trees from these disturbances, it is often possible to conduct salvage operations in disturbed areas to harvest timber and reduce economic losses and the threat of forest fires.

Insect Damage

The damaged area and volume loss caused by the most destructive insects are based on estimates of forested areas where 30 percent or more of the

foliage was removed. Usually, a number of years of repeated defoliation is required to kill a tree. This varies for each pest, the tree species being attacked, and other factors. Forested areas may be defoliated by more than one insect. Area reported as defoliated may include different degrees of severity.

Area The total area infested by forest insects where growth loss and/or tree mortality have occurred for the last 5 years is presented in Figure 6c. Insect infestation area in the AOU where growth loss occurred was highest during this period in 2000/01, at almost 7.3 million hectares. The infestation area where tree mortality has occurred has been relatively stable in the AOU during this period, averaging approximately 8 million hectares annually. Total provincial infestation area declined to 11.4 million hectares in 1997/98, but rose to almost 16.4 million hectares in 2000/01.

AOU Volume Insects causing significant damage to Ontario's forests include the spruce budworm, the jack pine bud-worm, the forest tent caterpillar, the gypsy moth, and a number of insects that chronically attack poplar and white birch. The estimated volumes lost in the AOU between 1996/97 and 2000/01, due to growth losses and mortality caused by damage from these insects, is reported in Table 6b. Spruce budworm caused the greatest volume losses during the last 5 years, but losses from spruce budworm have decreased significantly since 1996/97, to 4.2 million cubic metres in 2000/01. Losses from forest tent caterpillar damage, however, have been increasing since 1996/97 in the AOU, rising to almost 1.7 million cubic metres in 2000/01.

Figure 6c Area infested by forest insects.

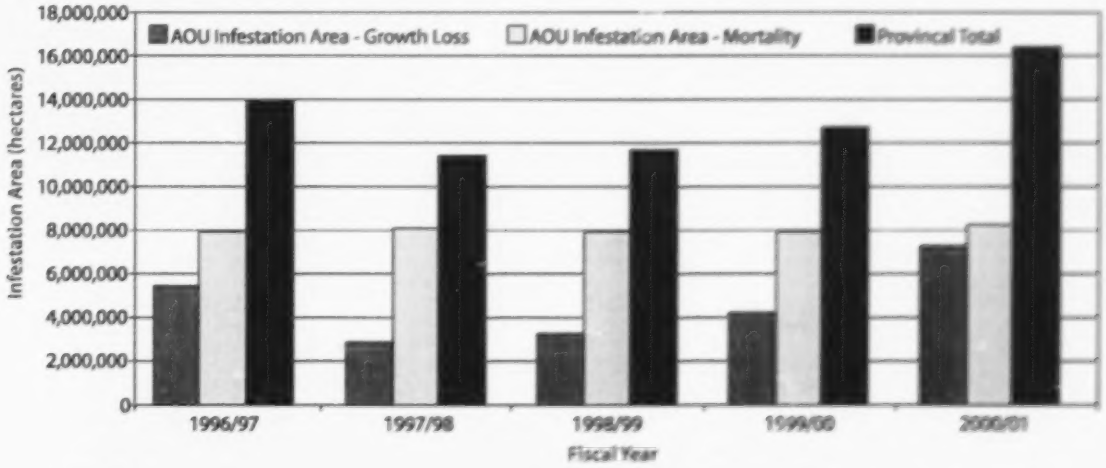


Table 6b Estimated wood volumes lost to insects within the AOU

	Volume Loss (cubic metres)				
Insect	**1996/97**	**1997/98**	**1998/99**	**1999/00**	**2000/01**
Spruce Budworm	9,871,627	7,177,639	5,208,468	3,921,618	4,215,458
Jack Pine Budworm	53,815	25,205	0	0	0
Forest Tent Caterpillar	251,579	421,976	564,622	848,682	1,693,114
Gypsy Moth	400	0	0	21	0
Other Poplar/Birch Insects	402,931	110,557	40,847	168,394	15,860
Other Insects	0	0	0	284	0
Total	**10,580,353**	**7,735,378**	**5,813,937**	**4,938,999**	**5,934,431**

Volume lost to insects can be lost either by reduced growth or by tree mortality. The estimated volumes lost in the AOU to forest insect damage from growth loss or tree mortality are illustrated in Figure 6d. During the 1996/97 to 2000/01 period, timber volume lost to growth loss increased from a low of just over 550,000 cubic metres in 1997/98, to 1.7 million cubic metres in 2000/01. In contrast, volume lost to tree mortality declined to 3.9 million cubic metres in 1999/00, from a high of 9.8 million cubic metres in 1996/97, and then rose slightly to 4.2 million cubic metres in 2000/01 .

The values for insect infestation area where growth loss has occurred, and the volume lost due to growth loss, appear to be on a rising trend in the AOU since 1997/98.

Figure 6d Estimated AOU volume lost to forest insects

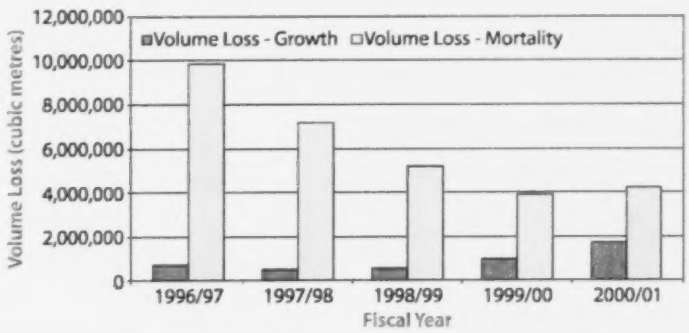
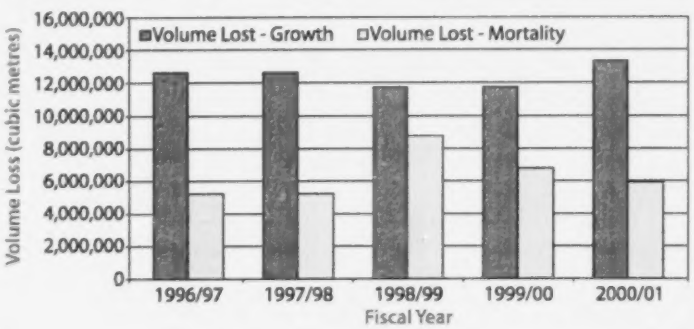


Figure 6e Estimated provincial wood volume lost to tree diseases



Diseases

The change in area and volume in a forest stand that results from natural mortality every year is not usually significant enough to be recorded for inventory update purposes. For example, chronic diseases such as root rot may kill only a few trees scattered throughout a forest stand. Therefore, no area loss is recorded for most diseases. However, an estimate of the volume of wood in the dead trees and volume of growth loss in the remaining live trees is made. Volume estimates of the effects of chronic disease consist of mortality and growth losses caused by rot, stem decay, and foliage dieback.

Provincial Volume The estimated volume lost to disease for the last 5 years, from growth losses and from tree mortality, is presented in Figure 6e. Growth losses from tree disease on a provincial basis for this period have been relatively stable, at approximately 12-13 million cubic metres lost an-nually. Volume losses to tree mortality from disease have been more variable, peaking at almost 8.8 million cubic metres lost in 1998/99.

AOU Volume As shown in Table 6c, estimated annual volume losses from disease in the AOU in 2000/01 were approximately 13.3 million cubic metres. Growth loss from decay amounted to over 5 million cubic metres in 2000/01, while root rot mortality was over 4.3 million cubic metres. There was also significant growth loss to hypoxylon canker (2.1 million cubic metres) and dieback (1.5 million cubic metres) in 2000/01.

Severe Weather

Windstorm damage (commonly referred to as "blowdown"), drought, and cold weather damage (ice/snow/severe cold) are the most common weather disturbances causing significant tree mortality and volume losses. Windstorms occur periodically, but must affect a sizeable area to be recorded. The estimates for windstorm damage are reported by individual management units, and are not part of the estimates provided by the Forest Health Monitoring partnership.

Table 6c Estimated wood volumes lost to disease within the AOU

	Volume Loss (cubic metres)				
Disease Type	1996/97	1997/98	1998/99	1999/00	2000/01
Volume Loss - Growth					
Decay	5,251,036	5,251,036	4,298,096	4,298,096	5,028,122
Dieback	1,559,038	1,559,038	1,457,322	1,457,322	1,547,164
Hypoxylon	2,001,272	2,001,272	2,032,607	2,032,607	2,093,934
Root Rot	301,425	301,425	266,519	266,519	235,040
Aspen Decline	0	0	0	48,623	32,954
Volume Loss - Mortality					
Root Rot	3,764,586	3,764,586	4,742,753	4,742,753	4,318,832
Stillwell Syndrome	0	0	1,711,531	0	0
Total Volume Loss	12,877,358	12,877,358	14,508,828	12,845,920	13,256,046

Area The area reported as being damaged by severe weather between 1996/97 and 2000/01 is shown in Figure 6f. The total provincial area damaged in 2000/01 was only 111,000 hectares, down from a total of almost 6.3 million hectares (most caused by drought) reported in 1998/99.

AOU Volume The estimated severe weather volume loss in the AOU of approximately 350,000 cubic metres in 2000/01 (Table 6d) was relatively minor, compared to the estimated loss of over 13 million cubic metres in 1999/00. Most of the severe volume loss in 1999/00 was due to windstorm damage, which generally causes much greater volume loss per unit area than other types of weather damage. Damage from the ice storm in Eastern Ontario in January 1998 is not accounted for in these figures, because of the difficulty in quantifying volume losses from this unusual weather event.

Figure 6f Severe weather damaged area

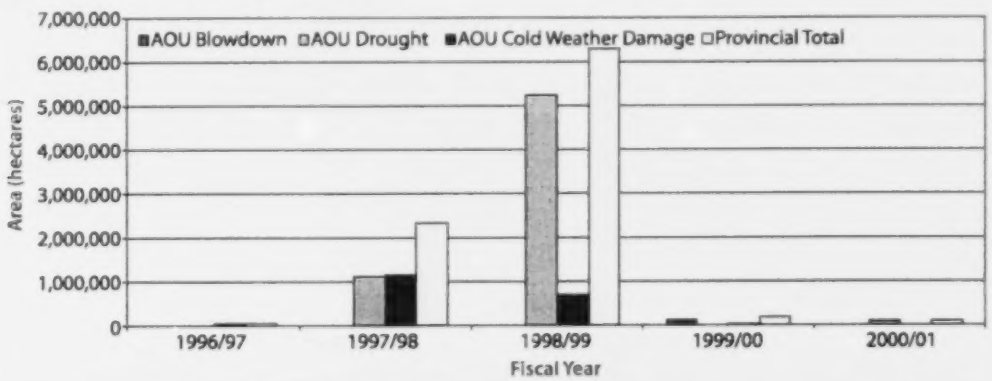


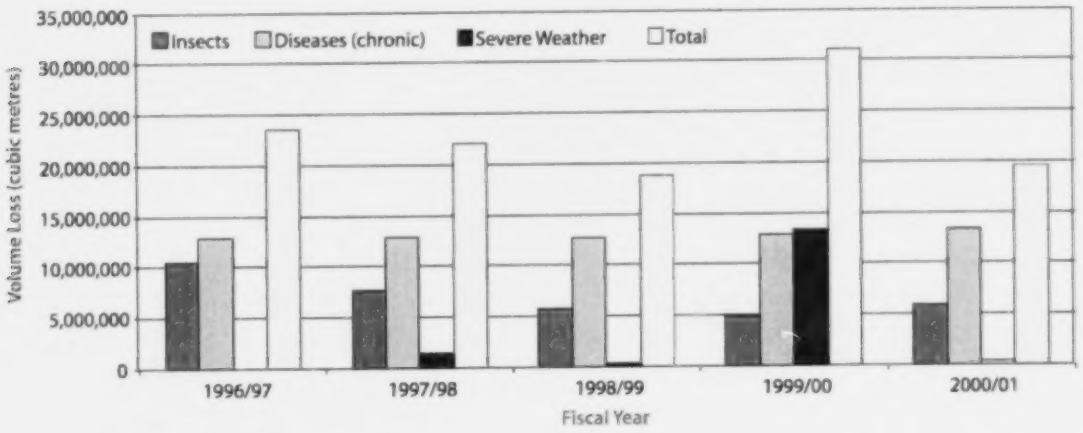
Table 6d Estimated wood volumes lost to severe weather within the AOU

	Volume Loss (cubic metres)				
Disturbance Type	1996/97	1997/98	1998/99	1999/00	2000/01
Blowdown	0	0	0	13,242,128	286,022
Drought	0	1,363,545	224,020	0	62,593
Cold Weather Damage	5,491	118,116	47,191	68,626	0
Total	**5,491**	**1,481,662**	**271,210**	**13,310,753**	**348,615**

Combined Insects, Disease, Severe Weather Losses

AOU Volume Estimates of total wood volumes lost in the AOU from 1996/97 to 2000/01 due to insects, disease, and severe weather are illustrated in Figure 6g. This figure shows that combined losses were at their lowest in 1998/99 (less than 19 million cubic metres) and at their highest in 1999/00 (over 31 million cubic metres).

Figure 6g Estimated AOU wood volume lost to insects, disease, and severe weather



Forest Harvest

The level of allowable harvest in a management unit is determined through the forest management planning process. The MNR requires that the allowable harvest for a management unit be set at a level that will sustain a healthy forest over time. Harvesting in each management unit is controlled and monitored according to the approved Forest Management Plan. These plans specify both allowable harvest area and the associated volumes. However, control of the allowable harvest is by area.

Natural Disturbance Pattern Emulation

The fundamental principle in emulating natural disturbance is to harvest and regenerate Ontario's forests in more natural patterns, ensuring that the needs of wildlife species are met and healthy diverse ecosystems with their many benefits are passed on to future generations. Under the *Crown Forest Sustainability Act* and subsequently with the publication of the *Forest Management Guide for Natural Disturbance Pattern Emulation* (NDPE Guide) in 2001, Ontario has been changing its forest practices so that forest biodiversity and natural processes are more proactively maintained. This is accomplished, in part, by emulating as closely as possible the landscape patterns (i.e. variation in size and shape) produced by forest fires, most notably during the implementation of the clearcut silvicultural system in the boreal forest. At the same time, MNR acknowledges that harvesting does not emulate all the effects of forest fires.

While forest harvesting can never exactly duplicate natural disturbances in the forest, the NDPE Guide promotes timber harvesting practices that emulate the natural range and pattern of fire disturbances - both small and large. This variation in harvest pattern creates desirable habitat for wildlife species. Smaller disturbances favour the creation of habitat for species such as moose, black bear and ruffed grouse, because this size of disturbance creates a lot of "edge" (where different forest types, features, or age classes come together). Larger disturbances, over time, create habitat for species which prefer large,

uniform forests, such as the American marten, the woodland caribou, and the great grey owl. Wildlife species have evolved in forest patterns that have largely been shaped by wildfire. Therefore the widest possible range of wildlife species will benefit by emulating the broadest range of natural disturbance patterns.

Silvicultural Systems Used in Ontario

Harvesting in Ontario is one of a series of actions that, when combined with other actions of forest renewal and maintenance (e.g., tending, protection etc.) represents a silvicultural system. These systems are classified according to the method of harvesting. Ontario uses three silvicultural systems: selection, shelterwood, and clearcut.

Selection Silvicultural System

Mature, unhealthy or undesirable trees are continuously removed individually or in small groups over an entire area, throughout the forest life cycle. This method produces stands with trees of different ages and is referred to as uneven-aged management.

Shelterwood Silvicultural System

Mature trees are harvested in a series of two or more cuts to encourage natural regeneration and growth under or next to the residual trees. This is done by cutting trees uniformly over the stand area or in groups or narrow strips. Stands with trees approximately the same age are produced with this system.

Clearcut Silvicultural System

The volume available from areas harvested under this system is usually harvested in one operation. Individual trees within the harvest area and/or parts of forest stands are retained for silvicultural reasons (e.g., seed trees) or to provide protection for forest values (e.g., marten habitat). Regeneration methods used can be natural, assisted (e.g., planting) or a combination of both methods. This method produces stands where most of the trees are at about the same age, and is referred to as even-aged management.

Average and Maximum Size of Clearcuts

The *Crown Forest Sustainability Act* requires "using forest practices that within the limits of silvicultural requirements, emulate natural disturbances and landscape patterns while minimizing adverse effects on plant life, animal life, water, soil, air, and social and economic values, including recreational values and heritage values". The Timber Class EA approval provides for a range of clearcut sizes, not to exceed 260 hectares, unless supported by sound biological or silvicultural reasons. It also recognizes that a range of clearcut sizes is required. Efforts to provide a range of disturbance sizes have resulted in some planned clearcuts being larger than 260 ha, with appropriate rationale provided in Forest Management Plans.

Cut patterns, sizes, and distribution are developed based on the applicable forest management guides in accordance with natural conditions, historical disturbance and landscape patterns, forest types, silvicultural characteristics of tree species, and fish and wildlife habitat needs. When appropriate, forest management operations within cut blocks are further altered or prohibited to protect identified site-specific forest values by implementing measures (e.g., reserves and harvest restrictions) specified in the guides.

The NDPE Guide provides direction to forest managers on designing harvest areas to more closely resemble natural disturbances by leaving more standing trees, as individuals and as peninsular and insular patches, scattered throughout irregularly-shaped harvest areas. It also contains guidance for measuring clearcut size. This Guide will be implemented on individual management units over five years as new Forest Management Plans are prepared, beginning with plans approved for implementation in 2003.

In this report, the area statistics for average and maximum size clearcuts often refer to the area cut in a particular year, without consideration of harvests in previous years or nearby clearcuts. The use of a consistent method of measuring and reporting clearcuts, including consideration of contiguous harvest from year to year, will improve in future reports as the NDPE Guide is implemented. Meanwhile, until clearcuts are measured and reported consistently

throughout the province following the direction in the NDPE Guide, comparison of the average and maximum clearcut sizes between management units may not be valid.

Boreal Forest Other key forest management guides used to design clearcut sizes and patterns within the Boreal Forest include: *Timber Management Guidelines for the Provision of Moose Habitat* and *Forest Management Guidelines for the Conservation of Woodland Caribou: A Landscape Approach.*

The provision of moose habitat includes direction for range management and specific stewardship for values such as aquatic feeding areas. In northwestern Ontario, in locations where significant woodland caribou populations occur, application of the woodland caribou guide takes precedence over application of the moose habitat guide for determination of clearcut size.

In 2000/01, 44 management units within the Boreal Forest reported average clearcut sizes from 14 to 1,935 hectares. Maximum clearcut sizes reported ranged from 55 to 3,063 hectares.

Great Lakes-St. Lawrence Forest Harvest planning in the Great Lakes-St. Lawrence forest must account for historic natural disturbance regimes, cover types, landscape patterns and wildlife habitat management practices. It is assumed that the landscape-level needs of most species will be met if forest management is conducted to maintain a landscape with the same mix of ecosites and age classes in patterns similar to those that occurred in the natural presettlement forest. In the Great Lakes-St. Lawrence forest, the primary stand-replacing natural disturbance agents have been a combination of wind and fire events.

Through an ecosystem management approach to landscape-level management, forest managers attempt to address the habitat requirements of many wildlife species. The specific habitat requirements of selected species are also considered. Some species, such as pileated woodpecker, are area sensitive and need large blocks of forest. Other species such as white-tailed deer prefer small patches and an abundance of edge habitat. Some species, such as moose, require a complex mosaic of forest types and ages. To provide for a diversity of habitat needs when planning for forest harvest, a variety of harvest area sizes must be employed.

Over the past five years in the Great Lakes-St. Lawrence forest, the selection silvicultural system has been used in approximately forty five percent of the area harvested. The shelterwood silvicultural system has been employed in about thirty five percent of the area harvested. The clearcut silvicultural system has been used in the remaining twenty percent of the area harvested the Great Lakes-St. Lawrence forest type.

For the clearcut silvicultural system in 2000/01, 12 management units within the Great Lakes-St. Lawrence Forest reported average clearcut sizes ranging from 4 to 40 hectares. Maximum clearcut sizes ranged from 18 to 258 hectares.

Harvest Area

The area harvested annually using the three silvicultural systems, from 1996/97 through 2000/01, is shown in Figure 6h. Total area harvested using the clearcut silvicultural system increased by about 2,210 hectares (1.2%) over the last year, while the shelterwood and selection silvicultural systems increased by about 1,620 hectares (15.4%) and 3,310 hectares (28.3%), respectively.

Figure 6i illustrates the total provincial area harvested from 1996/97 through 2000/01, and includes a summary by MNR region for 2000/01. The total harvest area increased approximately 3 percent from 1999/00 to 2000/01, to 220,400 hectares. During the 1996/97 to 2000/01 period, area harvested varied from 208 to 224 thousand hectares, reflecting variations in

Figure 6h Area harvested by silvicultural system

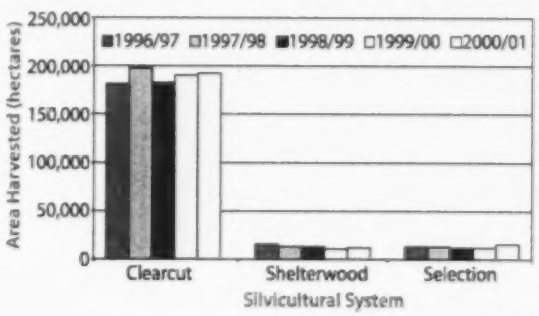
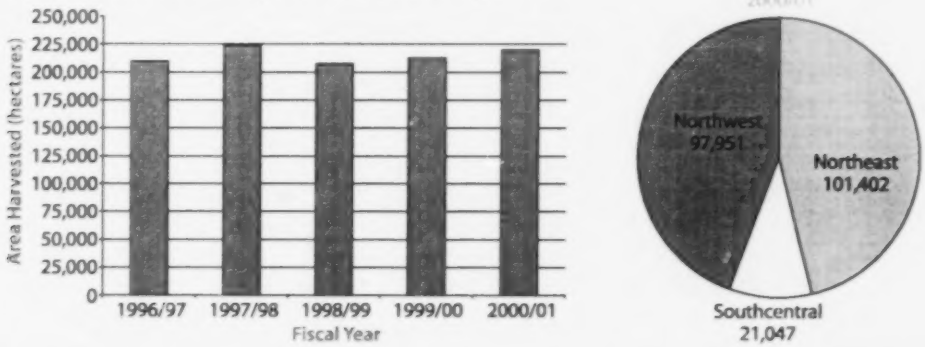


Figure 6i Area harvested by fiscal year and MNR region.



factors such as market conditions, utilization, and forest access. The Northeast Region (101,402 hectares) had the largest regional harvest area in 2000/01, representing 46 percent of the total, while the Northwest Region was second at 97,951 hectares, or 44.4 percent of the total. The Southcentral Region, which has a much smaller forest area, had the lowest total harvest at 21,047 hectares, or 9.6 percent of the total.

Figure 6j shows the total harvest area from 1996/97 to 2000/01 compared to the provincial area disturbed by fire for the same period. Over the past five years harvest area has fluctuated between 207,671 and 224,360 hectares, while fire disturbance area has varied from a low of only 6,647 hectares in 2000/01 to a high of 449,982 hectares in 1996/97.

When large areas are burned by fire or destroyed by windthrow or insects, forest companies often harvest some of the remaining dead and damaged wood. This salvage harvest is usually carried out a year or two following the causal disturbance. Figure 6k shows the area salvaged over the last five fiscal years. In 2000/01, about 7,670 hectares were salvage harvested, compared to 5,120 hectares in 1999/00.

Figure 6j Forest area disturbed by harvest and fire for all Crown land.

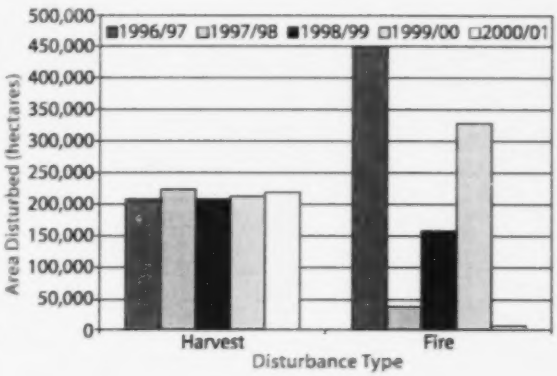
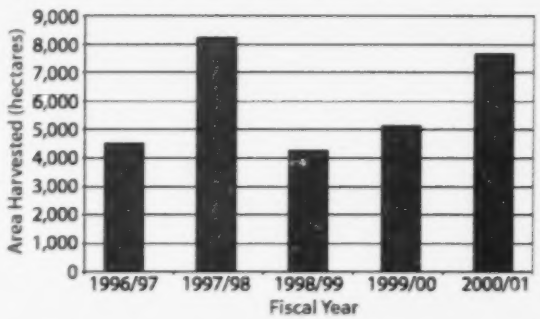


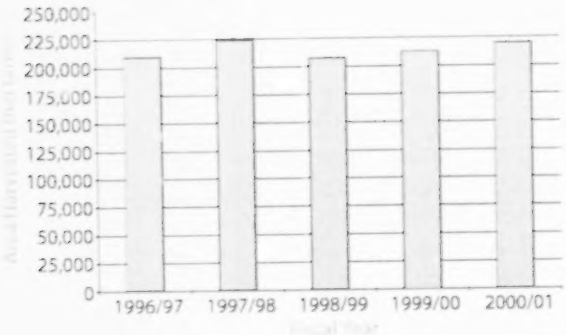
Figure 6k Salvage area harvested.

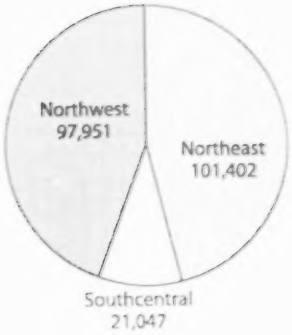


Harvest Volume

Total provincial softwood and hardwood volumes harvested from 1996/97 through 2000/01 are illustrated in Figure 6l. In 2000/01, the total provincial harvest volume was approximately 24.7 million cubic metres, an increase of approximately 15% over the 1996/97 harvest volume. In the past 2 fiscal years the volume of wood harvested has increased at a faster rate than the area harvested, likely due to changes in the types of stands harvested, delayed delivery of wood stored in the bush to mills, increased utilization, and/or changing market conditions.

Wood volumes harvested in 2000/01 in the MNR's three regions are shown in Figure 6m. The 2000/01 regional harvest volumes were: 12.0 million cubic metres, or 48.5 percent of the total harvest volume in the Northwest Region; 11.5 million cubic metres,

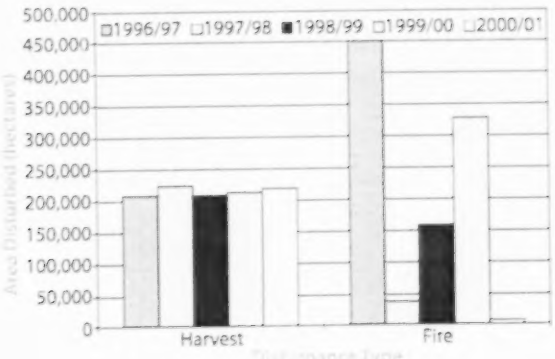


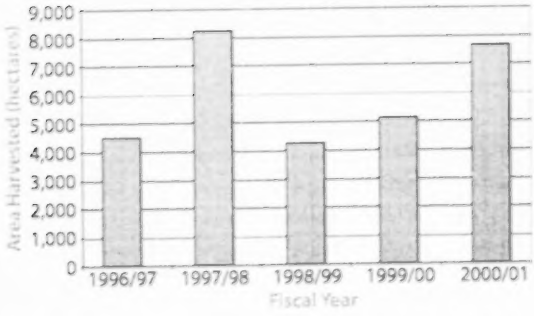


factors such as market conditions, utilization, and forest access. The Northeast Region (101,402 hectares) had the largest regional harvest area in 2000/01, representing 46 percent of the total, while the Northwest Region was second at 97,951 hectares, or 44.4 percent of the total. The Southcentral Region, which has a much smaller forest area, had the lowest total harvest at 21,047 hectares, or 9.6 percent of the total.

Figure 6j shows the total harvest area from 1996/97 to 2000/01 compared to the provincial area disturbed by fire for the same period. Over the past five years harvest area has fluctuated between 207,671 and 224,360 hectares, while fire disturbance area has varied from a low of only 6,647 hectares in 2000/01 to a high of 449,982 hectares in 1996/97.

When large areas are burned by fire or destroyed by windthrow or insects, forest companies often harvest some of the remaining dead and damaged wood. This salvage harvest is usually carried out a year or two following the causal disturbance. Figure 6k shows the area salvaged over the last five fiscal years. In 2000/01, about 7,670 hectares were salvage harvested, compared to 5,120 hectares in 1999/00.





Harvest Volume

Total provincial softwood and hardwood volumes harvested from 1996/97 through 2000/01 are illustrated in Figure 6l. In 2000/01, the total provincial harvest volume was approximately 24.7 million cubic metres, an increase of approximately 15% over the 1996/97 harvest volume. In the past 2 fiscal years the volume of wood harvested has increased at a faster rate than the area harvested, likely due to changes in the types of stands harvested, delayed delivery of wood stored in the bush to mills, increased utilization, and/or changing market conditions.

Wood volumes harvested in 2000/01 in the MNR's three regions are shown in Figure 6m. The 2000/01 regional harvest volumes were: 12.0 million cubic metres, or 48.5 percent of the total harvest volume in the Northwest Region; 11.5 million cubic metres,

Figure 6l Hardwood and softwood volumes harvested on Crown land

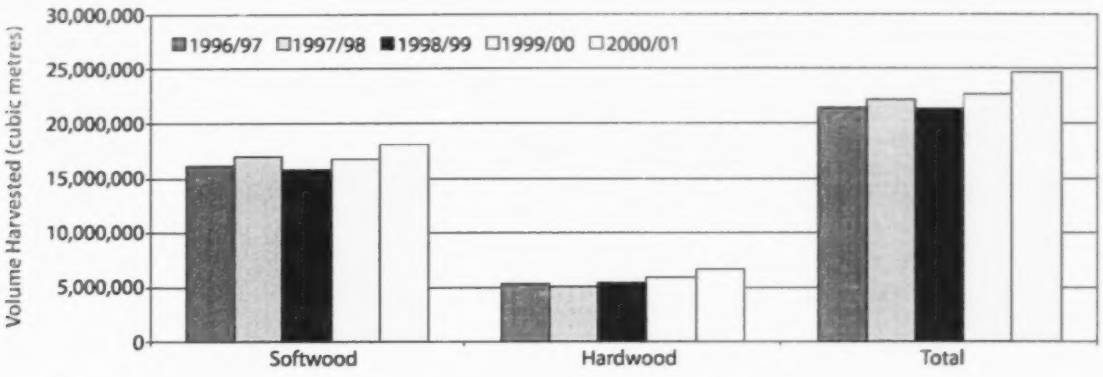
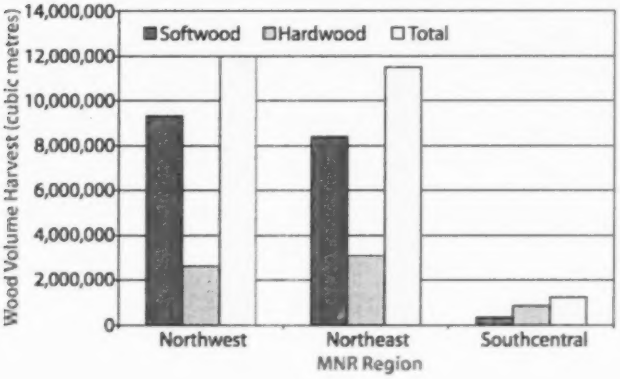


Figure 6m Wood volume harvested by MNR region and species group



or 46.6 percent of the total harvest volume in the Northeast Region; and, 1.2 million cubic metres, or 4.9 percent of the total harvest volume in Southcentral Region. Softwood tree species accounted for 73 percent of the total harvest volume with a harvest of over 18 million cubic metres. This is an eight percent increase over the 1999/00 softwood harvest. The hardwood harvest volume of almost 6.7 million cubic metres accounts for 27 percent of the provincial harvest total. This is a 13 percent increase over the 1999/00 hardwood harvest volume.

The harvest volumes by individual species for 1996/97 through 2000/01 are shown in Table 6e. Ontario's forest harvest in 2000/01 increased approximately 9.5 percent over the previous year, due primarily to increases in the harvest of spruce (mostly black spruce), jack pine and poplar, although the harvest of most species (with the exception of white pine and cedar) increased during this time. Fluctuations in the harvest volumes of individual tree species from year to year are largely due to changes in market demand, and variations in the species encountered on the areas to be harvested.

Harvest Volume Compared to Other Disturbances

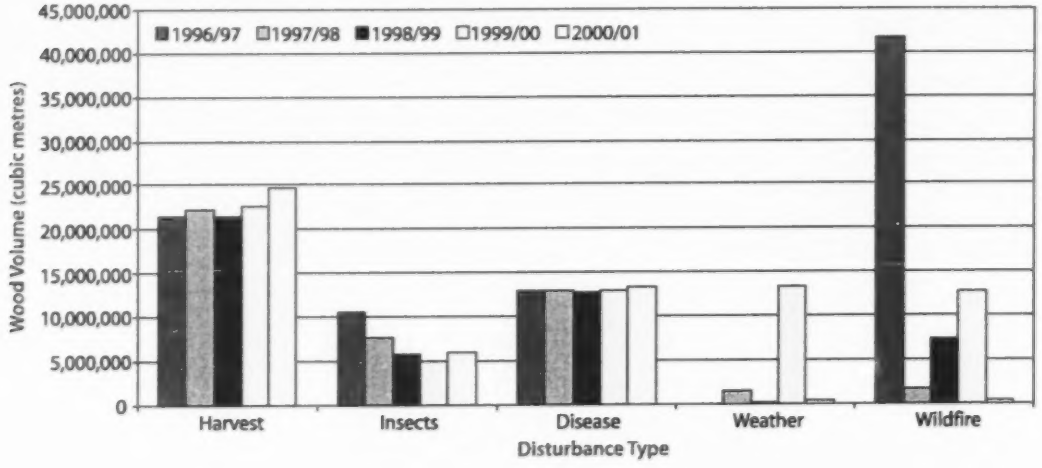
A comparison of wood volumes affected by natural and human disturbances to the forest, including insects, disease, weather, wildfire and harvest, are shown in Figure 6n for the five-year period from 1996/97 to 2000/01. Over this time frame the effects of weather and wildfire were quite variable, while wood volume lost to disease has been relatively constant. Fire volume losses were highest in 1996/97 at almost 42 million cubic metres, while the smallest annual fire loss occurred in 2000/01 when only 413 thousand cubic metres were burned. Harvest volume has shown an increasing trend, while losses to insects have declined overall during this period.

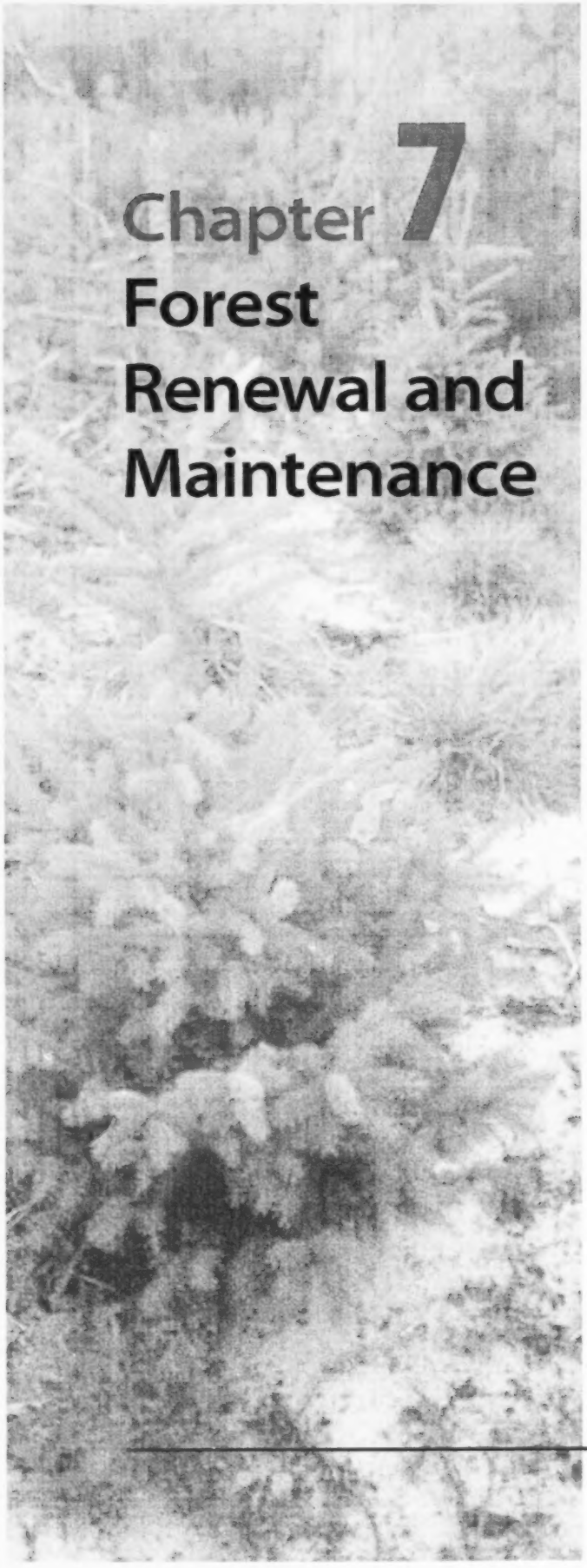
Table 6e Harvest volume by species, 1996/97 - 2000/01 (cubic metres)

Softwood Species	1996/97	1997/98	1998/99	1999/00	2000/01
White Pine	408,440	400,378	428,476	487,382	447,107
Red Pine	202,250	212,210	228,838	210,434	227,590
Jack Pine	6,439,813	6,249,545	5,967,239	5,742,312	6,317,096
Spruce	8,561,823	9,311,204	8,632,913	9,630,317	10,346,407
Hemlock	9,075	11,845	15,874	19,540	26,485
Balsam	526,122	642,314	524,967	581,037	669,494
Cedar	4,124	5,950	11,541	26,348	25,015
Tamarack	8,536	15,108	24,940	23,211	26,502
Other Softwoods	4,918	194,308	2,193	0	134
Total Softwoods	**16,165,101**	**17,042,862**	**15,836,981**	**16,720,581**	**18,085,830**
Hardwood Species	**1996/97**	**1997/98**	**1998/99**	**1999/00**	**2000/01**
Maple	493,242	544,081	432,590	465,364	585,161
Yellow Birch	41,228	51,754	35,137	30,138	47,807
White Birch	209,387	238,855	265,682	269,613	392,409
Oak	18,638	22,950	39,224	31,709	38,597
Beech	30,280	34,264	30,730	26,802	36,121
Poplar	4,399,774	4,168,609	4,635,851	5,033,829	5,532,833
Basswood	12,999	13,730	12,981	12,327	18,638
Ash	3,680	3,297	3,134	3,306	5,491
Other Hardwoods*	62,807	65,568	45,150	1,155	1,580
Total Hardwoods	**5,272,035**	**5,143,108**	**5,500,479**	**5,874,243**	**6,658,637**
Provincial Total	21,437,136	22,185,970	21,337,460	22,594,824	24,744,466

* The volumes for black cherry, ironwood, butternut, and elm are too small to be shown individually. They have been added together under Other Hardwoods.

Figure 6n Wood volume for harvest and other disturbances in the AOU.





Chapter 7
Forest Renewal and Maintenance

Under the terms of the *Crown Forest Sustainability Act*, forest managers are responsible for fully renewing the forests where they operate. Sustainable Forest Licence (SFL) holders must ensure that areas harvested are renewed to specific silvicultural standards as established in forest management plans, to ensure the long-term health of Crown forests. Long-term forest health is also promoted by forest maintenance operations. These operations include tending carried out to improve the survival, growth, or quality of a regenerating forest, and protection operations carried out to manage or prevent the damage caused by forest insects and diseases.

Forest Renewal

Activities needed to ensure the successful regeneration of all harvested areas are specified in all approved forest management plans in Ontario. Crown forests are renewed by both assisted and natural regeneration techniques, and these activities are reported annually.

Planting and seeding are the two most common types of assisted regeneration. Planting includes planting of bareroot and container seedlings. Container seedlings comprise almost 99 percent of the stock used in planting programs across Ontario in 2001/02. Seeding may be carried out directly from aircraft or by broadcast seeders on the ground. Renewal activities also include preparing an area disturbed by harvest or natural causes for regeneration through mechanical or chemical means, or by prescribed burning. The regeneration establishment period, from harvest to completion of the planting or seeding, can take up to five years.

Many tree species can re-establish themselves on a site without planting or seeding. These natural mechanisms include seeding from the adjacent forest or from cones left on site after the harvest, suckering of stumps and roots, and continued growth of young trees remaining on the harvested area. This natural regeneration can be enhanced through careful selection of the silvicultural system and harvest method (see Chapter 6).

In the past, reporting of natural regeneration annually at the time of harvest was not emphasized because some forest managers preferred to report it periodically after regeneration surveys had been completed. This delay in reporting, plus the regeneration establishment period, has in the past resulted in the reported annual renewal levels being substantially less than the reported annual harvest levels. With new reporting procedures introduced in 1996, natural regeneration is now reported promptly upon completion of the harvest.

Table 7a summarizes the renewal operations conducted on Crown land in 2001/02 for the province and for each MNR region. The area renewed in 2001/02 includes treatments on areas harvested or naturally depleted in 2000/01 or earlier.

The choice of silvicultural system or harvest method used is largely dependent on the biological requirements of the different tree species (see Chapter 6, Forest Disturbance and Harvest). Regeneration under the uneven-aged selection silvicultural system, shown in Table 7a, is carried out in tolerant hardwood stands in the Southcentral Region and, to some extent, in the Northeast Region. Approximately 13 percent less area was reported as regenerated using this system in 2001/02 than in 2000/01.

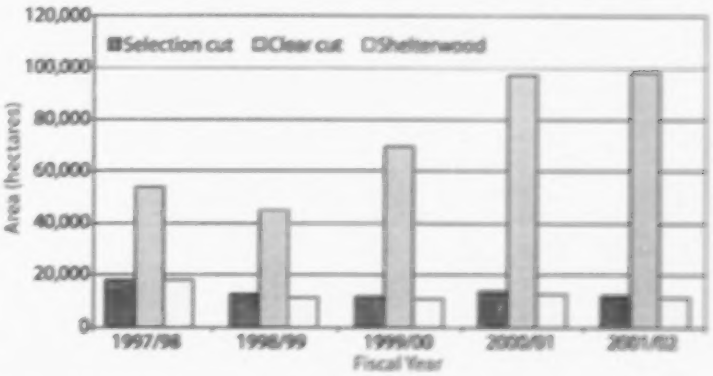
Table 7a Provincial renewal operations, 2001/02[1]

Regeneration	Northwest	Northeast	Southcentral	Total
UNEVEN-AGED MANAGEMENT				
Selection system (hectares)		4,549	7,569	**12,118**
Subtotal uneven-aged management		**4,549**	**7,569**	**12,118**
EVEN-AGED MANAGEMENT				
Natural regeneration (hectares)				
Clearcut system	25,872	71,222	1,133	**98,227**
Strip cut	63		6.0	**68**
Seed tree cut	3,331	2,906	31	**6,268**
Shelterwood system		6,252	1,919	**8,171**
Subtotal Natural Regeneration	**29,266**	**80,380**	**3,089**	**112,735**
Assisted regeneration				
Planting (hectares)	49,503	46,135	2,232	**97,869**
Trees (000's)				
Bareroot	1,312	74	594	**1,980**
Container	70,859	71,148	1,415	**143,423**
Seeding (hectares)				
Direct	10,668	3,491		**14,159**
With site preparation	3,023	2,060		**5,082**
Scarification (hectares)	94	225	136	**455**
Subtotal Assisted Regeneration (hectares)	**63,287**	**51,911**	**2,367**	**117,566**
Subtotal even-aged management (hectares)	**92,554**	**132,291**	**5,456**	**230,300**
TOTAL REGENERATION (hectares)	92,554	136,840	13,025	242,418
SITE PREPARATION (hectares)				
Mechanical	44,598	25,421	1,324	**71,343**
Chemical	2,333	3,117	126	**5,576**
Prescribed burn	271	80		**351**
TOTAL SITE PREPARATION (hectares)	47,202	28,618	1,450	77,270

[1] This table includes data reported from 2000/01 for the following 6 management units: Brightsand, Caribou, English River, Nakina North, Pic River Ojibway, and Wabigoon. Data for 2001/02 was not submitted from these 6 management units in time for this report.

The clearcut silvicultural system is the primary system used in the boreal forest of the Northeast and Northwest regions, mainly in stands containing jack pine, black spruce, poplar, and white birch. Approximately one percent more area was reported as naturally regenerated under the clearcut system in 2001/02 than in 2000/01.

Figure 7a Regeneration area by silvicultural system



Regeneration using the strip cut method is a variation of the clearcut silvicultural system. It involves the removal of the stand in progressive strips or blocks in more than one operation. The strip cut method is prescribed to encourage natural regeneration, provide wildlife habitat, protect fragile sites, or for aesthetics. Regeneration using the seed tree method is also a variation of the clearcut silvicultural system. It involves the removal of all commercial trees from an area, except for a small number of seed-bearing trees left singly or in small groups for regeneration purposes. The seed tree method is used primarily in white pine and red pine stands in the Northwest and Northeast regions.

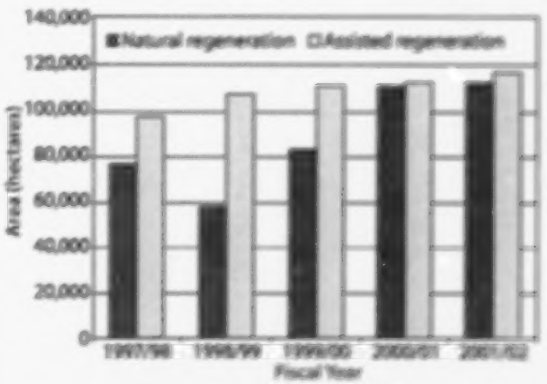
Natural regeneration using the shelterwood system is used mainly in white pine and tolerant hardwood stands in the Northeast and Southcentral regions. Approximately 25 percent less area was reported as regenerated using this system in 2001/02 than in 2000/01.

The area reported as regenerated using the selection system in 2001/02 was about average when compared to the previous three years, but down over 30 percent from 1997/98. The area reported as naturally regenerated using the shelterwood system in 2001/02 shows a similar trend, slightly below average when compared to the previous three years, but down over 50 percent from 1997/98. The area reported as naturally regenerated under the clearcut system has increased 82 percent since 1997/98 (Figure 7a).

The increase in area reported as naturally regenerated under the clearcut system is in part due to the reduction in delays in reporting natural regeneration, as mentioned earlier. The large increase in area reported as naturally regenerated under the clearcut system in the Northeast region is also due to an increase in the use of CLAAG (Careful Logging Around Advance Growth) practices in this region. CLAAG is an operational practice where the objective is to remove the overstorey, while protecting the understorey advance growth, and thereby regenerating an even-aged stand. Another operational practice known as HARP (Harvesting with Regeneration Protection) is applicable only in uneven-aged lowland black spruce. HARP protects and retains stems below a set diameter, leaving an uneven-aged and uneven-sized stand.

The total area of natural regeneration reported in all forest types under even-aged management was significantly higher in both 2000/01 and 2001/02 than in previous years - up 46 percent since 1997/98 (Figure 7b). Most of this increase in natural regeneration was due to the increase in area reported as naturally regenerated under the clearcut system.

Figure 7b Natural and assisted regeneration area



Assisted regeneration activities increased four percent from 2000/01 to 2001/02, and have increased 20 percent since 1997/98 (Figure 7b). The total number of seedlings planted in 2001/02 was 145 million, an increase of over 18 percent from 2000/01, and an increase of almost 34 percent since 1997/98 (Figure 7c). The use of bareroot seedlings further decreased in 2001/02, and bareroot seedlings comprised little more than one percent of the total planting activity in the province. Container stock was used in the other 99 percent of the program. This follows the continuing industry trend towards the greater use of container stock to meet planting requirements.

Jack pine is the main species used for seeding, most of which occurred in the Northwest region. The overall seeding levels in 2001/02 were up three percent over 2000/01, but down over 18 percent since 1997/98. Mechanical site preparation is the main site preparation method used in all regions, followed by chemical site preparation, then prescribed burning. Provincially, the total area treated with site preparation decreased 13 percent from 2000/01 to 2001/02, and is 17 percent lower than in 1997/98. (Figure 7d)

The total reported level of regeneration (including both natural and assisted regeneration) increased two percent in 2001/02 compared to 2000/01, and has increased almost 26 percent since 1997/98 (Figure 7e). Regeneration levels tend to follow fluctuations in harvest and, to a lesser degree, forest depletions from natural causes such as forest fires and insect epidemics. The provincial forest regeneration level of 242,418 hectares reported in 2001/02 is the highest over the last five years.

Comparison of harvest and regeneration levels on an annual basis is not appropriate because of the regeneration establishment period and the reporting delay. Comparison of average harvest and regeneration levels over a five-year period is more appropriate. The average total provincial harvest area from 1995/96 to 1999/00 was approximately 213,600 hectares. The average total provincial regeneration level from 1997/98 to 2001/02 was approximately 211,600 hectares, or only about one percent less than the average harvest level. More complete reporting requirements have resulted in regeneration levels growing closer to, and even exceeding, harvest levels over the last few years (Figure 7f).

Figure 7c Number of trees and container stock planted.

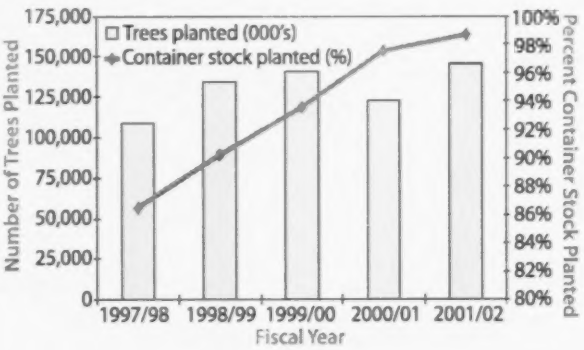


Figure 7d Seeding and site preparation area.

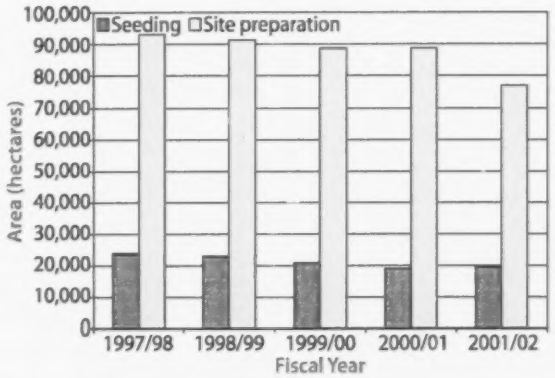


Figure 7e Provincial forest regeneration area.

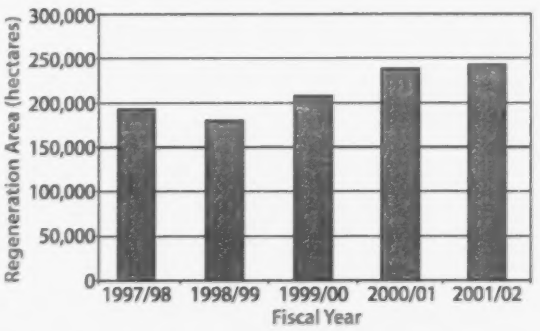
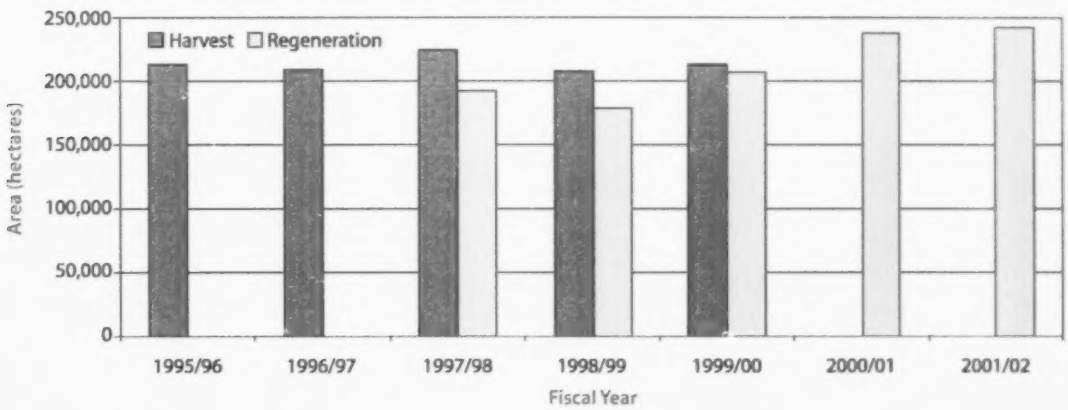


Figure 7f Five-year harvest and regeneration levels in Ontario



Forest Maintenance

Tending

Tending includes the operations of weeding, cleaning, thinning, spacing, and cultivation. Forest tending operations are carried out to improve the survival, growth, or quality of a regenerating forest. Tending may be done in young stands to help attain Free-To-Grow status, and conducted in uneven-aged stands to maintain the desired age-class distribution and volume.

Table 7b summarizes the tending activities conducted on Crown land in 2001/02 for the province and for each MNR region. Reported levels of tending were down four percent in 2001/02 from 2000/01.

The total area tended is down less than three percent provincially since 1997/98. Both manual and ground chemical cleaning declined almost 20 percent between 1997/98 and 2001/02, after peaking in 1998/99 (Figure 7g).

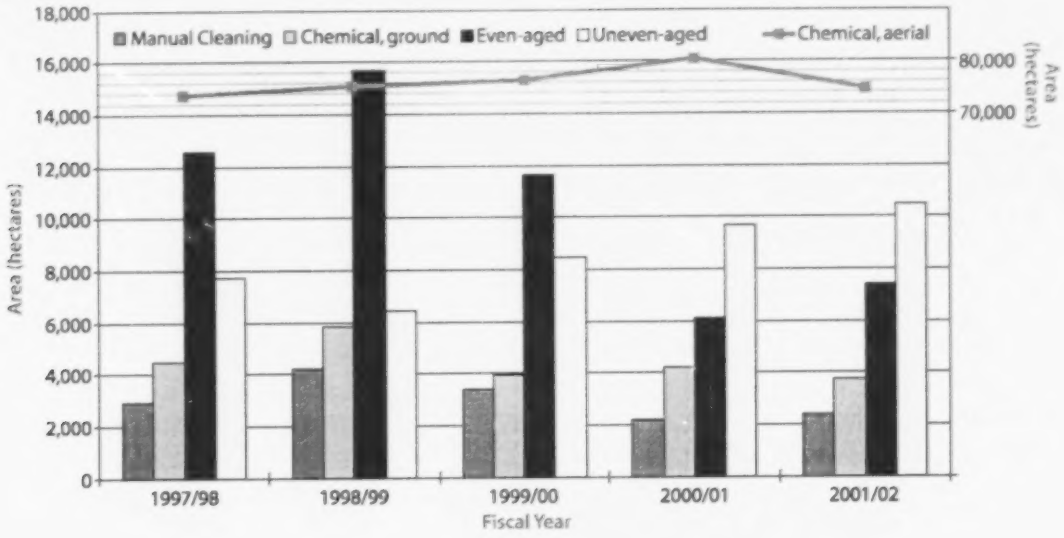
During this five-year period there was a reduction of approximately 40 percent in even-aged tending (spacing, precommercial thinning and improvement cutting), primarily in the Northwest and Southcentral regions. This was balanced by uneven-aged stand improvement work, which rose by over 35 percent during this time, primarily in the Northeast region. Aerial chemical cleaning activity remained relatively steady during this time, increasing less than two percent between 1997/98 and 2001/02.

Table 7b Provincial Tending Activities, 2001/02[1]

Tending (hectares)	Northwest	Northeast	Southcentral	Total
Cleaning				
Manual	650	952	777	2,378
Chemical - ground	1,570	1,255	898	3,723
Chemical - aerial	30,664	43,175	943	74,782
Mechanical				0
Spacing, Precommercial Thinning, Improvement Cutting				
Even-aged	4,562	2,498	336	7,396
Uneven-aged		4,649	5,865	10,514
Total Tending	37,446	52,529	8,818	98,793

[1] This table includes data reported from 2000/01 for the following 6 management units: Brightsand, Caribou, English River, Nakina North, Pic River Ojibway, and Wabigoon. Data for 2001/02 was not submitted from these 6 management units in time for this report.

Figure 7g Provincial tending activities



BAREROOT STOCK

Seedlings that have been grown in an outdoor environment and in the soil of a compartment in a nursery. These seedlings are lifted and the soil removed from the roots prior to shipment for planting.

CONTAINER STOCK

Seedlings, usually grown in a controlled environment such as a greenhouse, in some form of container. These seedlings, when shipped for planting, retain the growing media around their roots.

SITE PREPARATION

Disturbance of the forest floor, upper soil horizons and vegetation to create suitable conditions for assisted regeneration by mechanical or chemical means, or by prescribed burning.

SCARIFICATION

Mechanical preparation of a site for natural regeneration.

PRESCRIBED BURN

The knowledgeable application of fire to a specific land area to accomplish predetermined resource management objectives.

CLEANING

A manual, mechanical, or chemical operation in a young stand to reduce, eliminate, or suppress undesirable competing vegetation. Cleaning promotes survival and growth in desirable trees by removing competing vegetation of similar age that may overtop them, or are likely to do so.

IMPROVEMENT CUTTING

The elimination or suppression of less desirable trees in favour of more desirable ones, typically in a mixed, uneven-aged stand.

THINNING

A cutting made in an immature stand to accelerate growth of the trees left uncut. The goal is to foster quality growth and improve sanitation.

COMMERCIAL THINNING

Removing trees from a developing young stand so the remaining trees will have more growing space, dead and dying trees will be salvaged, and the operation will make a net profit.

PRUNING

The removal of live or dead branches from a standing tree to improve wood quality.

Protection

Protection operations prevent or manage the damage caused by insects and diseases. No forest protection activities were reported in 2001/02.

Funding for Forest Renewal and Maintenance

The financial mechanisms established under the *Crown Forest Sustainability Act*, and outlined in Chapter 4, ensure that there is funding available for forest renewal and maintenance.

Each company with a SFL contributes the appropriate level of renewal charges to an account in the Forest Renewal Trust Fund, which may only be used to conduct eligible silviculture work on the specific licence area from which the monies were generated upon harvest.

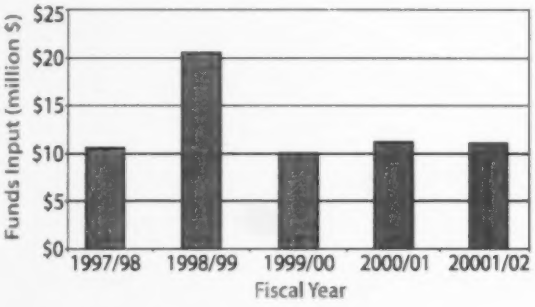
Operators with a Forest Resource Licence, who do not operate on a SFL, pay their renewal charges into the Forest Renewal Special Purpose Account. This account provides dedicated funding for forest renewal and tending on management units where harvesting and other operations are conducted on Crown land by companies that do not hold SFLs.

The MNR is responsible for administration of the Forest Renewal Special Purpose Account. As with the Forest Renewal Trust Fund, each forest or management unit has its own separate account to cover forest renewal and tending costs.

Money for a third fund, the Forestry Futures Trust, comes from a portion of the Crown charges that all licensees pay. In addition, any administrative penalties assessed under the *Crown Forest Sustainability Act* are paid into the Forestry Futures Trust Fund. This account, managed by an independent Crown committee, funds projects that meet MNR-approved criteria. To qualify, projects must be: a silvicultural activity on Crown land that addresses renewal of trees killed or damaged by fire; renewal of land where a licensee becomes insolvent; forest protection from insect or disease infestation; intensive stand management related to a critical wood supply; or, expenditures for Independent Forest Audits, Forest Resource Inventories, or conversion charges[7].

The annual contributions to the Forestry Futures Trust Fund since 1997/98 are presented in Figure 7h. The funds deposited to the Forestry Futures Trust Fund in 2001/02 amounted to approximately $11.1 million.

Figure 7h Funds input to the Forestry Futures Trust Fund.



Transition funding was provided initially by the MNR to the Forest Renewal Trust accounts and Forest Renewal Special Purpose Accounts to provide an adequate level of start-up capital and to ensure ongoing viability of the accounts. This amounted to $8.4 million in 1998/99.

In addition to these trust funds and special purpose accounts, the MNR supports forest renewal through the operation of the Ontario Tree Seed Plant and tree improvement programs.

Total forest renewal and maintenance expenditures in 2001/02 were almost $105 million . The source of these expenditures is presented in Table 7c. For 2001/02, the reporting mechanism for renewal and maintenance expenditures from the Forestry Futures Trust Fund has been changed. This amount now includes only project disbursements. In previous annual reports, other disbursements were included in the reported total, including expenditures for Independent Forest Audits, Forest Resources Inventories, and conversion charges.

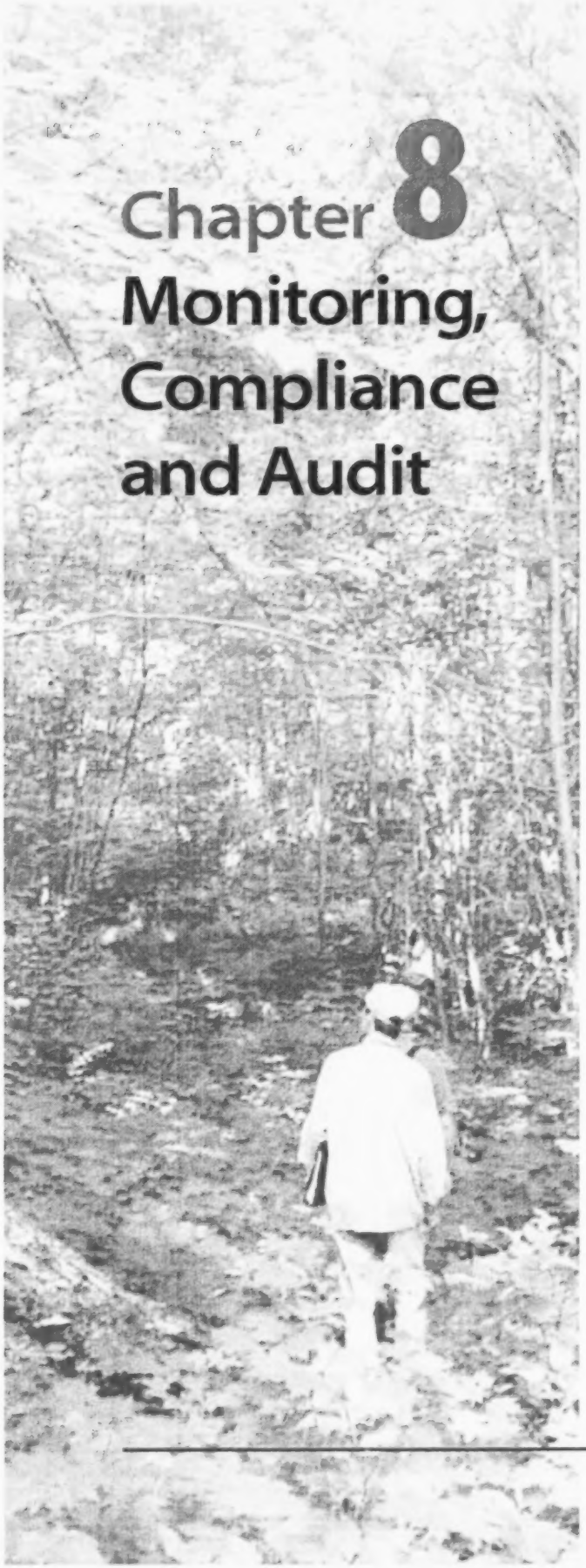
[7] Conversion charges are used to assist new, smaller SFLs with costs associated with the establishment of an SFL (e.g., inventory).

Table 7c Provincial Forest Renewal Expenditures, 2001/02

Source	Expenditure (million $)
Forest Renewal Trust Fund	$93.5
Forestry Futures Trust Fund	$8.3[1]
Special Purpose Account	$1.7
Direct MNR Expenditures	$1.3
Total Renewal Expenditures	**$104.7**

[1] For 2001/02 this amount includes only project disbursements. In previous annual reports other disbursements (for Independent Forest Audits, Forest Resources Inventories, and conversion charges) were included in the reported total.

In 2001/02, some adjustments to renewal rates occurred on individual management units to reflect the local costs of renewing and tending various species and to reduce specific accumulated surpluses in individual Renewal Trust Fund accounts. These rates will continue to be reviewed and adjusted annually to ensure that adequate levels of funding are maintained. A complete listing of the 2001/02 renewal rates for each management unit is provided in Appendix 5.



Chapter 8
Monitoring, Compliance and Audit

Forest management and operations in Ontario are monitored and audited to assess compliance and to evaluate progress and results. The three types of monitoring used are effectiveness, effects, and compliance. The information collected and analyzed for effectiveness monitoring determines how well the forest is growing and if management activities are producing the expected results. Effects monitoring assesses the impacts of operations on various aspects of the forest ecosystem through long-term studies. Compliance monitoring is conducted to ensure that the MNR and the forest industry carry out operations according to plans, regulations, and required standards.

By law, forest management in Ontario is also audited through Independent Forest Audits, providing independent published audits of management units across the province on a five year cycle. Forest certification, a separate but related process, is a voluntary market-oriented means of promoting sustainable forest management, in which an independent third party evaluates forest management systems according to certain pre-established certification requirements or standards.

Silvicultural Effectiveness Monitoring

Harvest and renewal activities are reported annually for the year they are implemented. Determination of the success of these activities in regenerating the forest occurs by specific assessment methods, conducted a number of years (usually five to 15 years) after regeneration treatments are completed.

Free-To-Grow (FTG) assessments are an effectiveness monitoring tool that provides an indication of the success of silvicultural treatments, and information to project the future forest condition. These assessments involve a variety of techniques, including field measurement of trees on sample areas of the forest, aerial surveys, and remote sensing. Some forest managers conduct these surveys annually, while others prefer to accumulate larger blocks that they assess once every few years. This has resulted in a backlog of areas needing assessment. The Forest Re-

newal Trust Fund now provides funding for these surveys on Sustainable Forest Licence (SFL) areas, and many forest companies are now assessing their regularly scheduled regeneration as well as the backlog areas.

Figure 8a summarizes the areas assessed and those that were declared FTG for 2001/02 by MNR region for the 35 management units that reported. Of the total area assessed for FTG, 70 percent was approved as having achieved the FTG standard within a set time period. This result varies by MNR region, from 78 percent in the Northwest Region and 71 percent in the Northeast Region to 46 percent in the Southcentral Region.

A summary of the area assessed and approved as FTG for the period 1997/98-2001/02 is presented in Figure 8b. After four years of decline in area assessed and approved as FTG, there was an increase in the provincial average of area declared FTG in 2001/02.

The percentage of assessed area that was declared FTG continued to decline in 2001/02 (Figure 8c). The reasons for this decline vary from region to region. The lowest rate of success is in Southcentral Region, which traditionally reports lower success rates than the two northern regions. The low rate is primarily attributed to the inability to conduct necessary follow-up treatments on stands regenerated in the early 1990s, resulting in forest stands not regenerating to desired species. Both 2000/01 and 2001/02 saw much larger areas surveyed in the Southcentral Region, which subsequently lowers the provincial average. The success

Figure 8a Summary of area declared free-to-grow by MNR region.

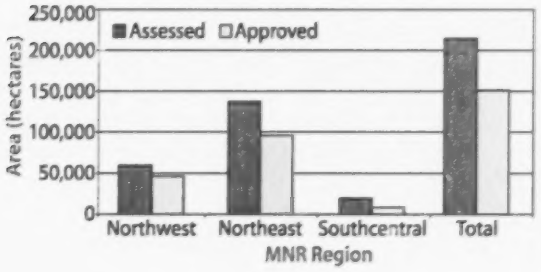


Figure 8b Summary of area declared free-to-grow by fiscal year.

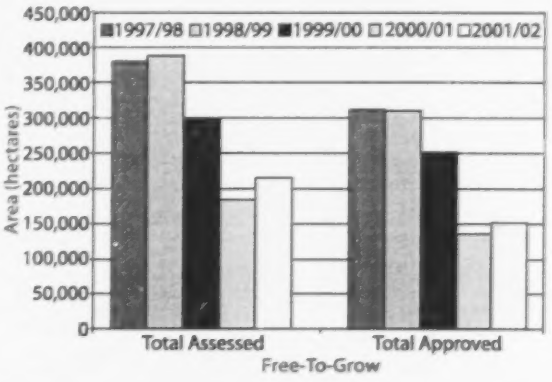
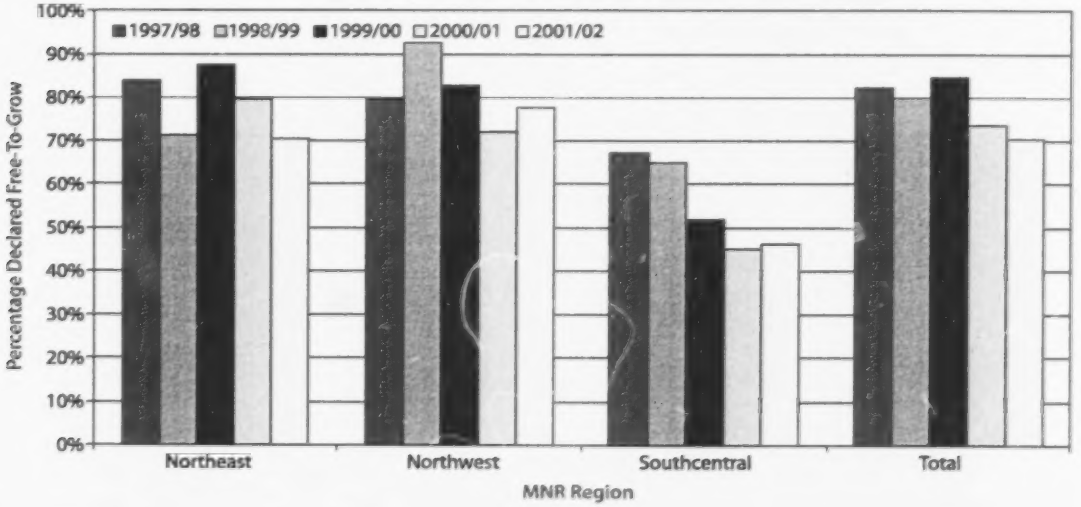


Figure 8c Percent assessed area declared free-to-grow by MNR region.



rate for the Northeast Region also dropped in 2001/02, but is still within the range of recent annual variation.

Regenerating areas being reported in 2001/02 were harvested and treated several years ago (typically five - 15 years), prior to the implementation of the *Crown Forest Sustainability Act* (CFSA) and the associated Forest Renewal Trust Fund and Forestry Futures Trust Fund.

Improvements in the success rates should be apparent in future reports because of these legislative and funding changes for the province. Support from the Forestry Futures Trust Fund and the Forest Renewal Trust Fund provide the funding for forest managers to ensure that harvested areas have the necessary treatments to achieve successful renewal. All harvested areas must be renewed successfully. Some of the areas found not to be classified as FTG at this time will need retreatment and others require tending (i.e. to suppress undesirable competing vegetation such as brush and grass). Other areas will simply require the passage of more time to allow for the incremental growth necessary to meet the height standard for FTG.

Effects Monitoring

Effects monitoring is the long-term assessment of potential forest management impacts on the forest ecosystem. As part of MNR's adaptive management practices, the results from effects monitoring studies are used to update existing forest management guides and policies, and to prepare new ones. Summaries of research activities and scientific studies for 2001/02 pertaining to the effects of forest operations and practices are presented in Chapter 10 of this report.

Compliance Monitoring

The forest operations compliance monitoring system in Ontario is designed to ensure the MNR and forest industry conduct forest operations in compliance with legislation and according to approved plans (e.g. forest management, fire, compliance) and operational standards.

At the management unit level, compliance inspection reports are prepared for harvest, access, renewal, maintenance, and protection operations. These reports help managers to focus on any activities that may require immediate attention, supply a database for identifying provincial trends, and provide feedback for compliance program adjustment.

Prior to 1998/99, the MNR was solely responsible for delivering forest operations compliance throughout Ontario. Effective April 1, 1998, all existing and future SFLs assumed lead responsibility for conducting a comprehensive program of forest operations compliance as a condition of their licences. The program includes planning, monitoring, inspection, reporting, training and education. At the same time, the MNR role changed from full inspection to one of monitoring/auditing, conducting spot-checks of industry activity, investigation, and enforcement. On the few management units (Crown units) where MNR still conducts forest operations, the MNR remains directly responsible for delivering all aspects of the compliance program.

The 2001/02 annual report is the fourth to report results of "industry self-monitoring and reporting" across the province, with information derived largely from a standard electronic format for inspection reporting. Effective April 1, 1998, it became mandatory for all MNR staff to use the Forest Operations Compliance Information System (FOCIS) to complete inspections of Crown units and any spot-checks or audits of SFLs, and to submit all inspections to the provincial database, the Compliance Information System. The forest industry completes and submits reports according to technical standards and requirements of The *Forest Information Manual*.

Interpreting the data collected through FOCIS and the Compliance Information System requires experience and understanding of the systems and the functions as carried out through the MNR and forest industry partnership. It is expected that several years of electronic data collection from these systems will be required before statistically confident and consistent information can be analyzed and reported.

Reports from 50 forest management units are included in the 2001/02 annual report.

The forest industry (SFL holder) is required to report all incidents of non-compliance on their management unit to the MNR. This includes infractions incurred by the SFL, overlapping licensees, shareholders and any private individual who contravenes the CFSA. Incidents related to the latter are not recorded against the SFL i.e., "non SFL related". The SFL does not have responsibility for assessing the degree of significance of non-compliance. This is strictly a MNR responsibility.

The MNR is the regulatory agency with respect to forest operations compliance. It verifies all instances of non-compliance as reported by companies. Therefore for each report of non-compliance by industry, there will also be at least one MNR inspection report. For incidents assessed as moderate or significant, the MNR will actively monitor the non-compliance until it is resolved. This action may result in additional reports of non-compliance by the MNR. In addition, the MNR undertakes random as well as planned spot-checks and audits of forest operations. This may result in additional reports of non-compliance which may not have been reported by a company, due to a difference in interpretation between industry and the MNR. Furthermore in some cases, especially those of a minor nature, industry may remedy the situation and deem the infraction too minor to report. As well, some companies may record an incident as "In Compliance With Comments". This category recognizes that a minor situation is present, with small variances due to operating conditions and/or operational practices. However the situation is recognized as generally correctable, with some room for improvement in operational practices.

In summary, fundamental differences between the MNR audit and verification role and the industry inspection role will lead to differences in non-compliance reported by MNR and industry, with the total of MNR non-compliant reports generally tending to be greater.

Ongoing training of all field inspectors will narrow the gap caused by differences in judgement. A compliance inspector competency program for all MNR and forest industry inspectors was initiated this year to improve overall skills and competencies in compliance assessment and reporting. In 2001/02, 71 forest sector representatives and 67 MNR staff attended the sessions. These courses result in competency certification, and will continue until all MNR forest operations compliance inspectors become certified.

Proposed changes to the reporting system in the near future will separate multiple and duplicative reporting of MNR and industry reports on the same operation. Results of both industry and MNR compliance inspections are summarized in Table 8a. For comparison purposes Table 8a also has rows at the bottom that list the 1998/99 to 2000/01 report summaries.

It can be clearly seen that the forest sector has taken the lead in compliance inspection and reporting per the requirement of SFL agreements. Overall, inspection of forest operations is at an all time high, especially in the major operations related to harvest and access. As well, the compliance rate as reported by the forest sector has remained relatively constant at about 95 percent. The five percent non-compliance rate relates primarily to minor infractions and could be considered acceptable given the magnitude of inspections and total area under operations across 50 management units. The MNR focused its auditing and spot-checking on those operations having the greatest potential for creating a non-compliant situation and impact on the environment.

Joint Inspections/Exchange

Of the total 8,870 inspection reports undertaken across the province, 1,062 were conducted jointly between MNR and company staff. Joint inspections are encouraged to establish consistency in observations and reporting, where new SFLs have been created, to maintain communications, for calibrating compliance, or where interpretation issues require resolution. It is a requirement that all "in-compliance" inspection reports be exchanged within 10 working days of the inspection report completion. In cases of non-compliance, industry must electronically report these situations within five working days or within

Table 8a Forest operations compliance inspection reports summary, 2001/02

	INDUSTRY			MNR					
Operation Type	Total # Reports	Total # Compliant Reports	Total # Non-Compliant Reports	Total Audits, Checks, Verifications	Total # Compliant Reports	Total # Non-Compliant Reports	Significance of Non-Compliant Reports Minor	Moderate	Significant
Access	1620	1533	87	582	430	152	117	31	4
Harvest	4120	3873	247	1379	1050	329	229	72	28
Renewal	764	753	11	119	109	10	4	6	0
Maintenance	238	229	9	31	29	2	2	0	0
Protection	11	11	0	6	3	3	3	0	0
TOTAL REPORTS									
2001/02*	6753	6399	354	2117	1621	496	355	109	32
2000/01	6161	5877	284	2280	1797	483	336	121	26
1999/00	4859	4538	321	2298	1733	565	388	124	53
1998/99	3166	2904	262	2440	1906	534	383	111	40

Note: The data for each operation type should not be examined in isolation due to the interrelated nature of activities. An inspection is comprehensive in terms of its ability to examine all related activities or sub-activities within the operation. Protection (e.g. fire inspections) is an activity within each main operation type.

Provincial Compliance Information System, November 04, 2003

24 hours of the discovery of the violation, if the violation is potentially significant. Similarly, the MNR must advise the SFL within the same time periods and via electronic report submission of any violations that it detects.

Road Washouts

Appendix 20 of the Timber Class EA approval requires the MNR to report annually on road washouts. Compliance inspections of water crossings conducted throughout 2001/02 indicate that forest companies reported 13 washouts. Twenty-five were identified by the MNR for a combined total of 38. Washouts can occur due to a number of factors, including natural causes such as spring flooding, heavy and/or prolonged rains, blockage due to beaver activity, and poor road construction techniques.

Actions Taken

In the self-monitoring and reporting compliance partnership model, industry must report non-compliance situations, and the MNR verifies, assesses the significance, and determines the appropriate remedy and enforcement action if any is required.

In many instances of minor non-compliance, immediate remedial action is undertaken and enforcement measures are not warranted. While the CFSA remedy and enforcement provisions apply largely to licensees of the Crown, any person who contravenes the CFSA may be charged. A total of 40 offence charges were laid under the CFSA against individuals who were unlawfully harvesting forest resources in a Crown forest (see Table 8b).

Although all incidents of non-compliance are reported in the fiscal year in which they occurred, a number of cases are ongoing (under investigation or subject to court action) in terms of remedy and enforcement action. These will be recorded when resolved. Compared to 2000/01, the total number of remedy and enforcement actions and resultant fines/penalties decreased in 2001/02.

Program Review

As part of its continuous improvement philosophy, the MNR has initiated a review of the forest operations compliance program, as delivered by MNR Districts and SFL holders. The purpose of the review is to assess whether the program is firmly founded, and the degree to which the changing

Table 8b Remedy and enforcement action taken, 2001/02

Method	Count	Fine
Administrative Penalty[a]	31	$97,164.44
Offence Charge[b]	40	$23,905.00
Stop Work Order	1	n/a
Repair Order	6	n/a
Compliance Order	11	n/a
Warnings	24	n/a
Total Actions Taken 2001/02	113	$121,069.44
Investigations (no charges warranted)	1	n/a
Total Actions Taken 2000/01	156	$292,595.77
Total Actions Taken 1999/00	145	$234,019.18
Total Actions Taken 1998/99	131	$206,665.97

[a] To Forestry Futures Trust Fund
[b] To Consolidated Revenue Fund (general revenue)

Source: CAVRS (Compliance Activity and Violation Reporting System) / OTAR (Ontario Timber Accounts Receivable) Sept. 03

roles and responsibilities between MNR and the forest industry have been successfully implemented. The results of the review will be included in the 2002/03 annual report.

Independent Forest Audits

Independent Forest Audits are a requirement of the CFSA, conditions #86 and #87 of the Timber Class EA approval, and are a condition of SFLs. All management units, both Crown and SFL, are audited at least once every five years to review actual operations and examine the forest management activities undertaken over the previous five years.

The audit is a systematic and documented verification process to assess adherence to the Forest Management Plan (FMP) and the planning process. Assessing the interpretation and application of provincial legislation, manuals, policies, and forest management guides at the management unit level is another part of the audit. Auditors also examine the effectiveness in achieving the planned objectives and provide an assessment of forest sustainability for the management unit. Lastly, audit teams review licensee compliance with the obligations of their specific SFL.

To address the audit purpose and objectives, the audit process and protocol document sets out the forest management principles, criteria, and procedures for undertaking Independent Forest Audits. The audit protocol identifies eight guiding principles: commitment, public participation, forest management planning, plan implementation, systems support, monitoring, achievement of management objectives and forest sustainability, and contractual compliance. For each principle, a series of specific criteria are identified that, when met, will result in achievement of the principle.

The audit terms of reference, including the audit team personnel requirements, are the same for all Independent Forest Audits. Each audit team has a lead auditor who is trained in auditing procedures and has current auditing experience. The lead auditor is supported by an audit team which includes at least two people with experience in forest management planning and forest operations, an individual trained in forest ecology or wildlife biology, and one person with experience in assessing socio-economic information, public consultation processes, and First Nations involvement in forest management planning.

All audit team members must have a minimum of seven years recent and relevant experience in forest types similar to those being audited. They must also be independent of the operations they audit and free from conflict of interest throughout the process. The audit team must include a Registered Professional Forester. For the 2001 audits, each audit team was required to provide an audit against the requirements in effect during the audit period and prepare their subsequent report for publication and release. The Independent Forest Audit reports are tabled in the legislature and available upon request.

The SFL holder and the applicable MNR district are required to jointly develop an action plan in response to each audit report. For each recommendation in the audit report, the action plan must state the required action, the organization and individual responsible for the work, deadline dates, and a method of tracking the progress of the action plan. A status report on the action plan is required two years after its approval to ensure progress is occurring as specified in the plan.

Summary of the 2001 Independent Forest Audits

The 2001 Independent Forest Audits were undertaken on 20 forest management units and resulted in the preparation of 19 audit reports. Two management units were amalgamated on April 1, 2001 and were, therefore, combined into one audit report. Seven of the management units were managed via SFLs throughout the five-year audit period. The Crown managed four units during the period, and nine were in transition, which resulted in a mix of Crown and SFL management during that time. External consultants, independent of the licensees and the MNR, performed the audits. Table 8c provides a complete listing of the 2001 audit reports by forest manager and independent auditor.

Eighteen (18) of the nineteen (19) 2001 audit reports concluded that the forests are being managed in general compliance with legislation and policy, or with principles of sustainable forest management, during the term of the audit. One concluded that the Kiashke River Management Unit could not

Table 8c 2001 Independent Forest Audits

Report/Forest(s)	Licensee/Forest Manager	Independent Auditor
Algoma Forest	Clergue Forest Management Inc. & MNR Sault Ste. Marie District	KBM Forestry Consultants Inc.
Armstrong Forest	Domtar Inc. & MNR Thunder Bay District	Callaghan & Associates Inc.
Auden Forest and Lake Nipigon Forest	Domtar Inc. & MNR Nipigon District	Callaghan & Associates Inc.
Bancroft Management Unit	MNR Bancroft District	KBM Forestry Consultants Inc.
Black River Forest	Great West Timber Limited	Arbex Forest Resource Consultants Ltd.
Black Sturgeon Forest	Bowater Pulp and Paper Canada Inc.	Callaghan & Associates Inc.
French-Severn Forest	Westwind Forest Stewardship Inc. & MNR Parry Sound District	KBM Forestry Consultants Inc.
Kiashke River Management Unit	MNR Thunder Bay District	Callaghan & Associates Inc.
Lac Seul Forest	McKenzie Forest Products Inc.	AuditFor Inc.
Magpie Forest	Dubreuil Forest Products Limited	Arbex Forest Resource Consultants Ltd
Minden Management Unit	MNR Bancroft District	KBM Forestry Consultants Inc.
Nipissing Forest	Nipissing Forest Resource Management Inc.	ArborVitae Environmental Services Ltd.
Pic River Ojibway Forest	Great West Timber Limited & MNR Nipigon District	Arbex Forest Resource Consultants Ltd
ShiningTree Forest	ShiningTree Forest Inc. & MNR Timmins District	ArborVitae Environmental Services Ltd.
Sioux Lookout Forest	McKenzie Forest Products Inc. & MNR Sioux Lookout District	AuditFor Inc.
Spruce River Forest	Abitibi-Consolidated Inc.	Callaghan & Associates Inc.
Sudbury Forest	Vermilion Forest Management Company Ltd. & MNR Sudbury District	ArborVitae Environmental Services Ltd.
Temagami Management Unit	MNR North Bay District	ArborVitae Environmental Services Ltd.
Wawa Forest	Clergue Forest Management Inc. & MNR Wawa District	KBM Forestry Consultants Inc.

be considered sustainable, as described in more detail below. Any significant risks to future forest sustainability were identified by auditors in the reports, and are noted in Table 8d and in the individual audit summaries which follow. For those units managed under SFLs, all 16 were recommended for licence extension. See Table 8e for further details.

The Algoma Forest audit report identified five recommendations for improvement and one best practice with regard to the management of the Forest. The recommendations include:

- the MNR must ensure the requirements in the *Forest Management Planning Manual for Ontario's Crown Forests* (FMPM) related to First Nations are met;
- the SFL holder needs to align the conifer enhancement objective and the conifer renewal targets in the 2000-05 FMP;
- road building and harvest practices should be improved to further protect water quality;
- the SFL holder needs to expand use of site preparation and tending techniques to encourage yellow birch, red oak and hemlock in non-boreal areas; and
- the MNR and the SFL holder need to develop a data collection program consistent with *Forest Information Manual* requirements and with the application of science and technology.

A notable best practice was the development and introduction of temporary water crossings to minimize site damage and ease road decommissioning.

The Armstrong Forest audit report outlined 20 recommendations for improvement of the management of the Forest.

Three recommendations focused on improvements to forest management planning. These were that:

- the MNR should reconsider the use of the Socio-Economic Impact Model (SEIM) as a planning tool;
- land allocations for wildlife habitat areas should not be withdrawn or deferred in calculating the available harvest area; and
- the approach to analyzing management alternatives should be revised to make the analysis less arbitrary.

Other recommendations include: the MNR needs to work with Aboriginal communities to improve the local Native consultation and Native values data collection processes to meet the unique needs of this Forest; the SFL holder should continue to work with the Whitesand Band to develop timelines for road rehabilitation; the MNR and the SFL holder need to monitor conifer stand development in areas where the public is op-

Table 8d Independent Forest Audit results for 2001 audits

Management Unit	In Compliance[1]	Sustainably Managed	SFL Extension Recommended[2]
Algoma Forest	yes	yes	yes
Armstrong Forest	yes	yes	yes
Auden Forest and Lake Nipigon Forest	yes	yes[3]	yes
Bancroft Management Unit	yes	yes	n/a
Black River Forest	yes	yes	yes
Black Sturgeon Forest	yes	yes	yes
French-Severn Forest	yes	yes	yes
Kiashke River Management Unit	no	no	n/a
Lac Seul Forest	yes	yes[3]	yes
Magpie Forest	yes	yes	yes
Minden Management Unit	yes	yes	n/a
Nipissing Forest	yes	yes[3]	yes
Pic River Ojibway Forest	yes	yes	yes
ShiningTree Forest	yes	yes	yes
Sioux Lookout Forest	yes	yes[3]	yes
Spruce River Forest	yes	yes[3]	yes
Sudbury Forest	yes	yes	yes
Temagami Management Unit	yes	yes[3]	n/a
Wawa Forest	yes	yes	yes

[1] Managed in compliance with legislation and policies that were in effect during the audit period
[2] This column is only applicable to management units managed under a Sustainable Forest Licence
[3] These reports identified either a risk to sustainability or a need for more data to confirm the results

posed to herbicide use; the MNR should ensure that values are mapped correctly in the FMP and Annual Work Schedules; the SFL holder needs to develop operating procedures to minimize site damage on lowland black spruce stands; slash piles should be eliminated or reduced; improvements should be made to the management of water crossings; bridges should have the appropriate signage; responsibilities for maintaining older water crossings need to be clarified; monitoring of water crossings should be increased; the SFL holder should facilitate training for operators to ensure compliance with legislation and policy; the SFL holder should improve its monitoring activity by monitoring regeneration prior to formal FTG surveys, and by explaining variances from planned monitoring activity in the annual reports; the MNR needs to adjust the white birch commitment for the Forest; and, the SFL holder should make all designated poplar available to specified commitment holders.

The Auden and Lake Nipigon Forests audit report included 27 recommendations to improve the management of the Forests. The auditor noted that it appeared the fundamental nature and composition of the forest had not been radically changed, and that the SFL holder was applying reasonable efforts to manage the forest sustainably. However, it was noted that additional data, particularly FTG assessments, were needed to confirm these findings.

Recommendations in this audit report include: the MNR needs to increase efforts to develop native values information with identified First Nations communities; the MNR and the SFL holder should continue to explore additional economic opportunities with First Nations' communities; landbase statistics contained in various FMP tables need to accurately portray current forest conditions at the beginning of the planning term, and should be readily comparable between tables; the MNR should reconsider the use of SEIM as a planning tool; land allocations for wildlife habitat areas should not be withdrawn or deferred in calculating the available harvest area; the MNR should ensure that its Natural Resource Values Information System is up-to-date and adequately supported, and that it continues to collect and interpret caribou data to support implementation of the woodland caribou guide; the SFL holder should improve the identification of unmapped tributary streams, and ensure proper prescriptions are used around them; the SFL holder and the MNR should co-operate to better manage slash, and develop an improved approach to measure and inspect for site damage; the SFL holder should estimate the marketability, and dispose of, the unutilized poplar piled at roadsides in three specified locations; the SFL holder needs to improve water crossing installations and road maintenance, and should ensure proper signage is in place for all bridges; in areas where it is not clear that stands have regenerated to the free-growing standard, more intensive survey methodologies should be used; compliance monitoring on the Forests needs to be improved; the SFL holder should review burns and scattered areas in the new Forest Resource Inventory to determine reporting and further assessment needs; and, the SFL holder needs to conduct annual meetings for the Forests' hardwood users, to rationalize wood flow and ensure licence commitments are being met.

Effective April 1, 2001, these two Forests were amalgamated as the new Lake Nipigon Forest.

The Bancroft Management Unit audit report identified seven recommendations for improvement of management of the Unit. These include:

- a strategy is needed to address the high proportion of planned allocations that have not been harvested;
- better use should be made of opportunities to access funding for renewal activities;
- site disturbance should be minimized;
- silvicultural activities should be improved, to provide for management of mid-tolerant species, and to provide Forest Operations Prescriptions for all diameter classes of tolerant hardwoods;
- Forest Operations Prescriptions should correspond with the appropriate Silvicultural Ground Rules; and
- the MNR needs to develop appropriate FTG survey methods for white pine in the Great Lakes-St. Lawrence forest region.

The Black River Forest audit report identified 11 recommendations for improvement concerning the management of the Forest. Highlights of these recommendations include that the MNR should:

- make budget allocations compatible with seasonal survey needs to facilitate the collection and use of values information;
- meet with remote tourist operators to seek ways to enhance their participation in public consultation processes;
- develop a more effective and efficient means of collecting and maintaining non-timber values information;
- ensure the Forest Management Planning Improvement Project is completed in a timely fashion to resolve matters concerning the complexity and length of time required for forest management planning; and
- share its direction for the implementation of Term & Condition #77 with the forest industry and Native communities.

In addition, the report specifies that the SFL holder should:

- make a more realistic assessment of operational constraints to forest management activities when developing harvest and renewal targets in FMPs;
- identify and document areas of historic bypass, as soon as possible;
- identify a road access corridor into the Swede Creek area at the first available opportunity, or remove the area from the productive forest landbase; and
- eliminate the backlog of FTG surveys within two years.

The Black Sturgeon Forest audit report developed 10 recommendations for improvement concerning the management of the Forest. The report advised the MNR to:

- complete value identification and protection and harvest block planning in the FMP before its approval;
- develop a more consistent and properly funded approach to identifying Native cultural values, and to develop a guideline for Term and Condition #77 implementation that includes First Nation and forest industry input;
- continue efforts to provide the people of Gull Bay with local consultation opportunities; and
- reconsider the use of SEIM as a planning tool.

The report also recommends that in future FMPs, the available forest area needs to reflect the actual condition of the Forest, and landbase information in tables should be readily comparable. As well, land allocations for wildlife habitat areas should not be withdrawn or deferred in calculating the available harvest area. An amendment to rectify deficiencies in the 2001 FMP should be prepared by April 1, 2002.

In addition, the report stated that the SFL holder should:

- ensure that only trained operators are working on the Forest;
- make poplar veneer available to commitment holders;
- increase utilization of the planned harvest;
- work with the contractor to improve operations quality on the North Sturgeon parcel; and
- rehabilitate chipper pads and slash piles to reduce productive land loss.

It was also recommended that the contractor remove accumulated industrial garbage. Improvements are also needed with respect to roads and water crossings: ageing untreated wooden bridges should be inspected annually; road grading and bridge maintenance practices need to be improved; and all bridges should have proper signage.

The MNR could enhance its administration of the Forest through consolidating practices and filling a key vacancy. Compliance monitoring and verification by both the SFL holder and the MNR should also be improved.

The French Seven Forest audit report identified 11 recommendations for improvement and three best practices related to the management of the Forest. Recommendations identified included:

- the MNR and the SFL holder need to improve operational planning and streamline the approval process to reduce delays;
- the SFL holder requires an approach to track and treat sterilized stands;

- the next FMP should have a detailed road use management strategy;
- the SFL holder, overlapping licence holders and the MNR should continue meeting to review the application of forest management practices in the field;
- the SFL holder should ensure that the next FMP includes quantified targets for management alternatives, and should run the Strategic Forest Management Model with historical utilization levels (as a comparison to full harvest levels); and
- Reports of Past Forest Operations need to satisfy FMPM requirements, be consistent with Annual Reports, and explain any discrepancies.

The SFL holder must also implement the Data Management Strategy by May 1, 2002 to determine the status and sustainability of the white pine forest unit. The SFL holder should complete an agreement with Grant Forest Products for the provision of poplar, as required by Appendix E of the SFL.

Examples of best practices include the SFL holder's public education program, *Your Forest, Your Choice*, and the MNR's diligence in monitoring insect infestations.

The Kiashke River Management Unit audit report indicated that the Unit was "... inadequately managed and does not meet the requirements of the CFSA, its implementation manuals, and the audit protocol", during the five-year period ending March 31, 2001.

The Kiashke River Management Unit is a unique situation. It was created in 1978, long before the development of the CFSA, to help foster native forestry opportunities. With the advent of new requirements of the CFSA, the 8,536-hectare Unit became too small to be viable as a forest management unit. The audit report bluntly requires that the Ministry bring the Unit into legal compliance by April 1, 2003, a step which has already been satisfied. Ministry managers anticipated that the Unit would require corrective action, and the audit has assisted by providing an independent assessment with recommendations to resolve outstanding issues. As a result, the Ministry revoked the "management unit" status of this landbase effective April 1, 2002, to bring it into compliance with legislation. An action plan was developed to address the other audit recommendations and will provide appropriate measures to rectify the difficulties reported on this unique and unusual management unit.

While many instances of non-compliance were observed on the Unit, the audit team made just 13 recommendations, many quite broad in scope. These include that the MNR needs to:

- bring the Unit into compliance with the CFSA and the *Environmental Assessment Act* by April 1, 2003, and clarify its intentions for future licensing of forest management operations on the Unit by September 1, 2002;
- initiate and lead discussions among affected parties with an interest in the Unit; and
- remove accumulated garbage from harvest sites and rehabilitate slash pile areas.

Regeneration surveys should be completed on all sites that have not yet been declared FTG to determine what treatments are necessary. Prescribed silvicultural work should be completed by September 30, 2003. The MNR should complete a Report of Past Forest Operations for the Unit by September 30, 2002, covering all management activity since 1988. The auditor acknowledged the MNR's commitment to "... the independent forest audit process and to open and public decision-making, as reflected in the undertaking of this rather unusual audit".

The Lac Seul Forest audit report established nine recommendations for improvement and five best practices concerning the management of the Forest. The auditors found that the Forest was managed sustainably during the audit period. However, there are two items that, if not managed progressively, could reduce the available harvest on the Forest. These issues are the lack of access to Working Circle #5, and the lack of hardwood markets. Recommendations are that:

- the Lac Seul Advisory Committee should have at least one member from the forest industry to improve communications with forest stakeholders;

- the SFL holder should proceed with harvest and renewal operations in selected parts of the Lac Seul shoreline buffer; and
- the MNR and the SFL holder should continue negotiating with the Slate Falls First Nation regarding road construction and forest management activities for the northern Working Circle #3.

Forest inventory records for the newly amalgamated Lac Seul Forest should be updated by the SFL holder to incorporate all historical records. The SFL holder should document its process for assessing sites and developing tending prescriptions, and continue pursuing the development of long-term agreements for viable hardwood markets. Examples of best practices outlined in the report include: the SFL holder's procedure to assist operators in identifying and adjusting harvest and renewal operations on specific ecosite types, and its program to assess, monitor and maintain culverts.

The Magpie Forest audit report gave three recommendations for improvement with regard to the management of the Forest. Dubreuil Forest Products should review its road grading techniques to improve surface drainage. The MNR should meet with remote tourist operators to seek ways to enhance their participation in public consultation processes. Finally, the MNR should make budget allocations compatible with seasonal survey needs and the collection and use of values information.

The Windco Management Unit audit report outlined seven recommendations for improvement for the management of the Unit. They recommended that silvicultural activities be improved to allow for management of mid-tolerant species and to provide Forest Operations Prescriptions for all diameter classes of tolerant hardwoods; operations be carried out in accordance with Forest Operations Prescriptions and Silvicultural Ground Rules; information storage by the MNR for wildlife inventory and values information be improved; adequate compliance monitoring and documentation of inspection occur; the MNR develop appropriate FTG survey methods for white pine in the Great Lakes-St. Lawrence forest region; and, the MNR ensure FTG surveys are conducted as required.

The Nipissing Forest audit report identified 18 recommendations for improving the management of the Unit. The auditor indicated that management of the Forest was consistent with the general principles of sustainable forest management. However, the management of low-quality hardwoods is a crucial issue, which will continue to challenge the Forest's managers. Recommendations include that the MNR should:

- help the Local Citizens Committee (LCC) to improve its public communications and progress reporting;
- modify the FMP development process so that more meaningful management alternatives are evaluated; and
- improve the provision of fish and wildlife survey information.

It was also recommended that a strategy for the management of low quality hardwoods be designed for inclusion in the 2004 FMP. The SFL holder should develop approaches to manage hardwood slash, and to reduce rutting. The SFL holder needs to address the use of tertiary roads in the 2004 FMP, and the MNR should revise forest road requirements to recognize the role and nature of tertiary roads in the Great Lakes-St. Lawrence forest. The SFL holder also must ensure that construction standards and environmental concerns are properly addressed in its construction and maintenance of roads and water crossings. It is very important the MNR and the SFL holder continue to work towards common understandings on compliance related matters, and to set appropriate monitoring priorities for the Forest. Training and other capacity building efforts are needed, so operators on the Forest can avoid non-compliance issues, and are able to undertake adequate compliance monitoring activity. Special attention should be paid to monitoring the compliance of Crooked Lumber [illegible]. It is also recommended that the SFL holder analyse FTG survey results to assess the effectiveness of silvicultural

treatments, and use relevant results in preparing the 2004 FMP.

The auditor commended the managers of the Forest for several items, including the broad range of silvicultural treatments used, and attempts to restore elements of the historical forest.

The Pic River Ojibway Forest audit report included nine recommendations for improvement of the management of the Forest. Recommendations were that the MNR should:

- meet with the remote tourist operator to seek ways to enhance their participation in public consultation processes;
- ensure that staff involved in the FMP process, receive adequate training to carry out the necessary work;
- complete the Forest Management Planning Improvement Project in a timely fashion to resolve matters concerning the complexity and length of time required for forest management planning; and
- share its direction for the implementation of Term & Condition #77 with the forest industry and native communities.

During plan development, the SFL holder should make a more realistic assessment of operational constraints to forest management activities. The protection of values is supported by the application of forest management guides where values have been identified; however, the SFL holder and MNR should continue efforts to improve the quality, quantity and maintenance of Area of Concern information. The SFL holder needs to document areas of historic bypass as soon as possible and eliminate the backlog of FTG surveys within two years.

The Shining Tree Forest audit report indicated three recommendations for improvement and four best practices regarding management of the Forest. Most importantly, the MNR needs to review the functioning of the LCC and explore options to increase its effectiveness. Other recommendations include that:

- the SFL holder develop and implement a slash management program; and
- the MNR update unit and shareholder information in the SFL.

Examples of best practices include: the approach used to incorporate a biodiversity strategy into the 1996 FMP and the excellent use of FTG assessment data in making projections about the future forest condition.

The Sioux Lookout Forest audit report described nine recommendations for improvement and two best practices concerning the management of the Forest. The auditors found the Forest has been managed sustainably during the audit period. However, failure to progressively manage the decadent balsam fir component could threaten long-term sustainability of the Forest. The auditors recommended that:

- the Lac Seul Advisory Committee have at least one member from the forest industry to improve communications with forest stakeholders;
- the SFL holder proceed with harvest and renewal operations in selected parts of the Lac Seul shoreline buffer;
- forest inventory records for the newly amalgamated Lac Seul Forest be updated, to incorporate all historical records; and
- formal procedures to assess sites for tending requirements and to develop appropriate prescriptions be designed.

The SFL holder needs to continue developing and searching for new hardwood markets. Silvicultural methods also should be developed, and funding secured, to renew budworm-damaged balsam fir stands.

The SFL holder's development of a program to assess, monitor and maintain culverts was identified as an example of best practice.

The Spruce River Forest audit report outlined 25 recommendations for improvement with respect to the management of the Forest. The auditor confirmed the Forest was being sustained under Abitibi's stewardship, but also noted the opinion that this is compromised by mining-related activities. The audit report identified that the MNR should improve values identification prior to harvest and enhance the Natural Resource Values Information system, so

that adding data can be more efficient. Other recommendations include: the quality of the Native Background Information Report needs to be improved; the MNR should develop a guideline for Term and Condition #77 implementation that includes First Nation and forest industry input; the SFL holder needs to improve its reporting of both bypass and areas of natural renewal; the MNR should revise the poplar commitments for the Forest; poplar veneer commitments should be addressed; and, road maintenance practices should be improved.

Three recommendations focused on improvements to forest management planning: the MNR should reconsider using SEIM as a planning tool; land allocations for wildlife habitat areas should not be withdrawn or deferred in calculating the available harvest area; and, to aid modelling and analysis, clear linkages should be provided between forecast and planned levels of reserves.

To ensure compliance, it is recommended that the SFL holder facilitate training opportunities for all operators. Several steps can be taken to enhance compliance monitoring. These include: negotiating a workable timeframe for signing off completed harvest areas; holding quarterly joint inspections of overlapping licensee operations; making improvements to the Forest Operations Compliance Inspection System; and, developing regional compliance histories on all operators.

To improve monitoring for effectiveness, annual reports should discuss all differences between planned and actual activities. The Ontario government, the mining industry and the prospecting community should reduce the damage caused to Crown forests by the unrestricted mining activities they undertake.

The Sudbury Forest audit report described 16 recommendations for improvement regarding the management of the Unit. These include that the MNR should:

- identify and address LOC educational needs prior to commencing the planning cycle for the 2005 FMP;
- ensure the planning team has all the expertise required by the FMPM;
- modify the FMP development process so that more meaningful management alternatives are evaluated;
- work with the SFL holder to develop a comprehensive Old Growth strategy for the Sudbury Forest;
- improve the provision of fish and wildlife survey information; and
- review its staff complement and roles to ensure it has adequate capacity for its forest management responsibilities.

As well, a strategy for the management of low-quality hardwoods should be developed for inclusion in the 2004 FMP. The SFL holder needs to address the use of tertiary roads in the 2004 FMP. The MNR should revise forest road requirements to recognize the role and nature of tertiary roads in the Great Lakes-St. Lawrence forest.

It is also recommended that the SFL holder continue providing compliance-related training to operators and ensuring adequate supervision. Special attention should be paid to monitoring the compliance of Goulard Lumber (1971). The SFL holder should accelerate its FTG survey program and use the results in the next FMP. As well, the MNR and the SFL holder must ensure appropriate mechanisms are in place to properly record Forest Renewal Trust expenses.

The auditor also commended managers of the Forest for several items, including their working relationship with First Nations.

The Temagami Management Unit audit report developed 22 recommendations for improvement and four best practices concerning the management of the Unit. The auditor indicated that the Unit was managed sustainably, but also noted two key threats to sustainability: the poor performance of access-control measures poses a short-term risk, and the continued lack of forest disturbance (natural or man-made) poses a longer-term risk.

The MNR should continue working with the LOC on a decision-making model that maximizes the value of LOC input. To enhance public participation for the 2004 FMP:

- the MNR needs to improve its record keeping for each stage of the public consultation process;
- there should be minimal overlap between the planning team and the plan review team; and
- MNR should ensure that First Nations receive a high priority in decisions related to future harvest allocations.

Other recommendations indicate that the MNR:

- review and correct errors in the 1999 FMP, and in the Forest Resource Inventory maps;
- improve the provision of fish and wildlife survey information;
- modify the development of socio-economic profiles to include up-to-date information from communities within the Unit and those receiving wood from it, as well as input from local and regional economic development officers;
- enhance management of tree improvement areas and upgrade seed collection processes;
- maintain an appropriate silvicultural monitoring system;
- work with all other relevant stakeholders to review access control procedures to increase their effectiveness;
- increase the number of staff assigned to the Temagami Area, to a level higher than the standard staffing template; and
- take steps to ensure a systematic application of high-quality operational standards.

Special attention should be paid to monitoring the compliance of Goulard Lumber (1971).

Examples of best practices were three aspects of management which the auditor found to be exemplary: the use of the Temagami Land Use Plan as a basis for forest management planning; the use of quantitative objectives for non-timber values; and the consultation planning and implementation activities for the "viewpoint" Areas of Concern. Among its conclusions, the audit team noted there "...are a number of very good things being done on the unit, and the MNR staff is highly motivated and conscientious." The auditor also expressed that "...many of the pieces are in place for the management of Temagami Forest to become a model of excellence..."

The Wawa Forest audit report identified 13 recommendations for improvement and two best practices concerning the management of the Forest. Ways to improve involve: the MNR reviewing appropriate forest policies and strategies to encourage better utilization and forest management in areas dominated by white birch; the MNR enhancing record keeping of correspondence with First Nations, and ensuring the annual report includes an accurate portrayal of Term and Condition #77 activities conducted in the previous year; the SFL holder improving accuracy in FTG mapping records, and in Silvicultural Ground Rules; the MNR ensuring all amendments are appended to the 1995-2000 Timber Management Plan, and all components required by the FMPM are included in the next FMP; and, the SFL holder implementing procedures that limit site damage and properly address snag tree retention.

To further protect water quality, road-building practices need improvement. The MNR and the SFL holder should develop a data collection program consistent with *Forest Information Manual* requirements and with the application of science and technology.

Best practices identified were: measures taken to encourage utilization and improvement of degraded low-volume stands, and co-operation in delivering an effective bridge removal and stream bank stabilization program.

Summary of 1996 - 2001 Audit Reports

Table 8e summarizes the audit results over a six-year period from program inception in 1996 up to the 2001 audits. With the completion of the 2001 audits, all management units have been audited at least once, and five have been audited twice. These 66 reports indicate the majority (86 percent) of Management Units were managed in accordance with legislative and policy requirements in effect during the audit term. Only two of the reports (3 percent) reached a conclusion recording significant concerns for compliance with requirements. The audit program is, therefore, serving its purpose. Audit reports identify areas for improvement and the MNR and SFL

Table 8e–Summary of 1996-2001 audit reports

Audit Year	Audit Reports	In Compliance[1]	In Compliance with Conditions or Significant Exceptions	Forest Manager			SFL Extension Recommended[2] (Crown Units not Eligible)
				Crown	Transition	SFL	
1996	4	4	-	-	-	4	4
1997	10	10	-	2	-	8[3]	8
1998	6	6	-	3	-	3	3
1999	11	8	2	2	4	5	9[4]
2000	16	11	5	3	3	10	13[5]
2001	19	18	1	4	9	6	15
Total	**66**	**57**	**7**	**14**	**16**	**36**	**52**

[1] Managed in overall compliance with legislative and policy requirements in effect during the period audited.

[2] SFL extension supported where applicable and/or licence obligations met during short term as licence holder.

[3] The Agreement with the Algonquin Forest Authority is included in this number.

[4] Three of the 1999 audit reports reached a conditional conclusion as to whether the licensee had met their obligations and/or whether the licence should be extended.

[5] Three of the 2000 audit reports concluded that licence renewal was recommended conditional upon the SFL holder making progress to resolve / implement the recommendations for which they are specifically responsible.

holders continue to respond by implementing solutions, documented in mandatory action plans that are developed subsequent to the completion of audit reports. Where more serious deficiencies are found, auditors are reflecting this in their conclusions regarding sustainability and licence extension.

Future Program

There are nine Independent Forest Audits planned for 2002: Algonquin Park, Crossroute, Hearst, Nagagami, Northshore, Pineland-Martel, Romeo Malette, Sapawe, and Superior Forests. The results of these audits will be published upon completion. All of these Forests are being audited for a second time under the Independent Forest Audit Program.

Comprehensive Review of the Independent Forest Audit Process

In 2000/2001, the MNR commissioned a comprehensive external review of the independent forest audit process. The objectives of the project were to confirm what parts of the process were working well and to identify areas that could benefit from improvement. The external consulting team was comprised of six members with expertise in forest management, environmental and forest management auditing, biology/ecology, public consultation and program evaluation. This comprehensive review used extensive consultation with stakeholders, the public and interested parties through several methods, including broadly distributed questionnaires, workshops, interviews, and written submissions. The review was conducted between December 2000 and April 2001, at which point the final report was provided to the MNR.

The consulting team reported in its overall conclusion that the IFA is a high-quality program, with a solid foundation, and five years of successful delivery. The consultants reported that many components of the audit process are working well, and change is not warranted in these areas. For other parts of the process the team concluded that potential improvements might be beneficial. For those areas that might benefit from change, options were identified.

The MNR project steering committee used the results of the consultation and review to develop recommendations, incorporating options presented by the consultant's report. The recommendations will result in several changes to the administration of the Independent Forest Audit program. The review was timed so that key changes resulting from it could be implemented prior to the conduct of the 2002 audits.

In December 2001, the MNR posted an information notice on the EBR identifying a series of planned changes. These include the following items:

- increasing the effectiveness of the audit in making an overall assessment of sustainability;
- enhancing the independence of the administration of the annual audit program;
- more timely public release of the audit reports;
- enhancing the public awareness of the audit process and access to it; and
- continuing to review and update the Independent Forest Audit Process and Protocol.

In the future, ongoing review within the Independent Forest Audit Program will continue to monitor and forecast changes within the provincial and national forest sectors to allow the audit process to maintain its relevance and currency.

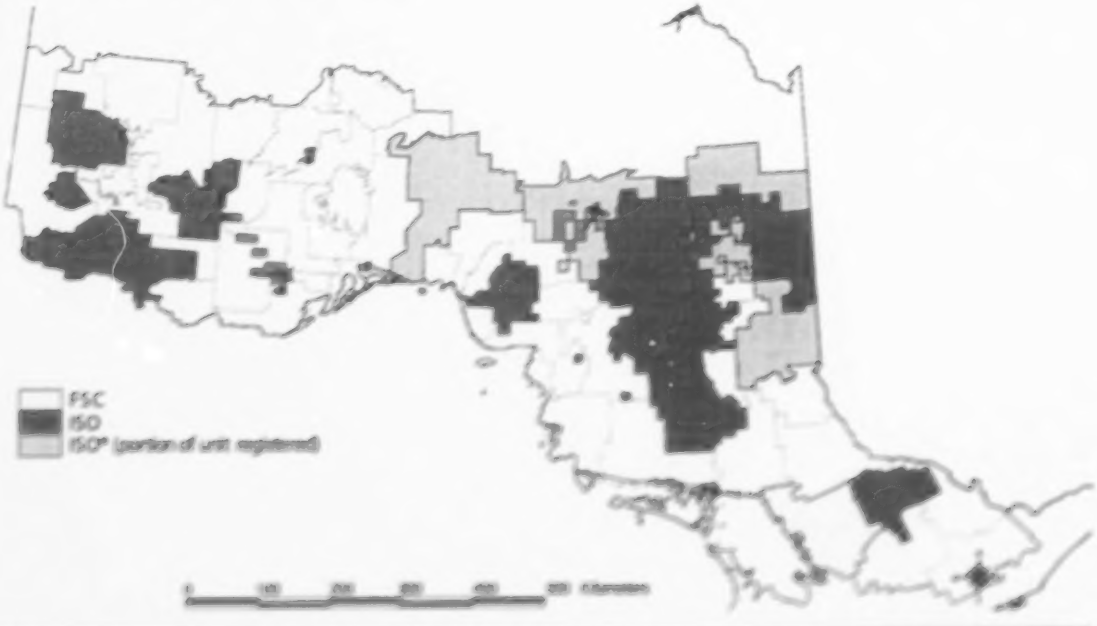
Forest Certification

Forest certification is a voluntary market-oriented system which involves evaluating forest management systems and/or operations by ecological, economic and social standards, as validated by an independent third party (the certifier). This process requires applicants to demonstrate they are complying with or progressing towards those certification standards. Within the limits of its provincial government mandate, the MNR provides technical and policy advice, both during the development of certification systems and to forest companies seeking certification of forest lands in Ontario.

In addition to the generic International Organization for Standardization Environmental Management System 14001, there are three forest certification standards being considered by Ontario forest companies. These are the international Forest Stewardship Council Principles and Criteria for Forest Management, the Canadian Standards Association Sustainable Forest Management Standard (approved by the Standards Council of Canada), and the American Forest and Paper Association's Sustainable Forestry Initiative.

In Ontario, 10 SFL managers, one SFL-like agreement manager, eight overlapping licensees and three private forest managers were successful in obtaining International Organization for Standardization 14001 registration of their operations. This number is expected to continually

Figure 8d Status of forest certification in Ontario, March 31, 2002.



increase over the next one to two years with many companies intensively pursuing forest certification/registration. In addition, Westwind Forest Stewardship Inc., a SFL holder, three privately owned forests and one municipal forest have been certified by a Forest Stewardship Council-accredited certifier. Figure 8d depicts the status of forest certification/registration to the end of March 31, 2002.

The MNR ensures the sustainable forest management of Crown forests through a rigorous policy and regulatory framework. Forest companies operating in Ontario are required to comply with long-term, ecosystem-based forest management planning. Renewal of licences to harvest timber is dependent on satisfactory results of a mandatory Independent Forest Audit. Ontario's forest management standards are progressive and demanding. Forest companies are well positioned to meet any forest certification/registration system standard.

Chapter 9
Aboriginal Peoples

Term and Condition #77

Term and Condition (T&C) #77 of the Timber Class EA approval requires the MNR to negotiate with Aboriginal peoples at the local level regarding opportunities for more equal participation in the benefits of forest management. In referring to Aboriginal people, T&C #77 includes communities, individuals, enterprises, and organizations. T&C #77 states:

"During the term of this approval, MNR district managers shall conduct negotiations at the local level with Aboriginal peoples whose communities are situated in a management unit, in order to identify and implement ways of achieving a more equal participation by Aboriginal peoples in the benefits provided through timber management planning. These negotiations will include but are not limited to the following matters:

a) Providing job opportunities and income associated with bush and mill operations in the vicinity of Aboriginal communities.
b) Supplying wood to wood processing facilities such as sawmills in Aboriginal communities.
c) Facilitation of Aboriginal third party licence negotiations with existing licensees where opportunities exist.
d) Providing timber licences to Aboriginal people where unalienated Crown timber exists close to reserves.
e) Development of programs to provide jobs, training and income for Aboriginal people in timber management operations through joint projects with the Department of Indian and Northern Affairs.
f) Other forest resources that may be affected by timber management or which can be addressed in the timber management planning process as provided for in Condition 23(c)."

Implementation of T&C #77

The scope of T&C #77 is broad, and its application and implementation are determined at the local level. The arrangements and agreements effected by MNR district managers and Aboriginal communities

take different forms, in an effort to accommodate the unique needs, capacities, and situations of individual Aboriginal communities in the context of available opportunities.

The implementation of T&C #77 may include the involvement of individual Aboriginal communities or groups of communities with common interests situated in a common geographic area.

In its decision, the EA Board ordered the MNR to build upon initiatives it was already pursuing and to provide new opportunities for Aboriginal communities to benefit from forest management activities in their local areas.

The MNR released the *Implementation Guidelines for Term and Condition #77 of the Class Environmental Assessment* in January 1996, and revised and re-released the guidelines in 1999. The purpose of the guidelines is:

- to provide MNR district managers with a consistent framework for implementation of T&C #77 that builds upon existing initiatives and facilitates the development of new initiatives; and
- to provide Aboriginal communities and forest industry companies with the information MNR district managers will use in the implementation of T&C #77.

MNR implements T&C #77 in a manner consistent with the *Crown Forest Sustainability Act*, which provides legislative authority to the MNR for the sustainable management and use of forest resources. The *Crown Forest Sustainability Act* has enabled the MNR to put mechanisms in place that may assis in facilitating the implementation of T&C #77.

While responsibility for implementation of T&C #77 rests with the MNR, the EA Board recognized that the involvement of other parties is critical to successful implementation. Such involvement would include participation of First Nations and other Aboriginal communities, the forest industry, and other government bodies (e.g., Ontario ministries, the Department of Indian and Northern Affairs Canada, and Natural Resources Canada).

Aboriginal participation in forest management and economic development activities is summarized under four categories: access to resources, role in planning and management, silvicultural opportunities, and training and development.

Access to Resources

First Nations are often in a position to operate as forest harvesters. Although Ontario's wood supply is almost completely allocated to Sustainable Forest Licence (SFL) holders, the MNR has helped the industry and Aboriginal communities negotiate types of access. For example, overlapping licences have been issued to First Nations, and First Nations have the first opportunity to buy-in as an independent operator when opportunities arise.

Role in Planning and Management

MNR Districts have sought out effective forums for Aboriginal communities to have a greater say in the planning and management of nearby forest resources. It is mandatory for Forest Management Plans (FMPs) to include a detailed Native Background Information Report and Native Values maps. Districts have provided financial assistance to some communities either to prepare these components themselves or to hire archaeological research contractors.

In some districts, First Nations are represented directly with industry and government on the forest management planning team responsible for the planning decisions for each five-year plan.

Silvicultural Opportunities

Forest renewal offers a long list of operational requirements including growing trees, planting, tending, thinning, spraying, and site preparation. Many First Nations have experience in at least some silvicultural activities and district managers have sought specific agreements between industry and First Nations to detail the type and scope of contract work that can be made available on a competitive basis. This work, taken together, can contribute to an effective economic development program.

Training and Employment

Although the MNR does not have a training mandate, district managers have found ways to help co-ordinate existing federal and provincial programs to assist Aboriginal communities in preparing for increased participation in forest management activities.

On a local level, districts have provided hands-on training for many years through the Native Internship Program and Sault College's Aboriginal Resource Technician Program.

In some districts, the forest industry provides the training strategy, recruitment and hiring support, and business opportunities for independent contractors. In some instances, the MNR is taking the lead to assist in providing the building, equipment and leadership to establish an Aboriginal training centre.

For many years MNR districts have been providing opportunities for joint projects with First Nations, with the MNR providing training, funding, facilities, and equipment.

District Progress

The MNR is required to report on the progress of negotiations under T&C #77 for each district. Of the 26 MNR districts, five are outside the Area of the Undertaking (AOU), including Aylmer, Aurora, Cambridge, Midhurst, and Peterborough. A detailed update of the benefits provided to Aboriginal communities in 2001/02 for each MNR district follows.

Algonquin Park

Management unit: Algonquin Park Forest

There are no First Nations or other Aboriginal communities situated within the Algonquin Park Forest. However, Algonquin Park is part of the traditional territory of several Algonquin communities surrounding the provincial park, including Mattawa-North Bay, Pikwakanagan (formerly Golden Lake), and Whitney. Portions of the park are also included in the Robinson-Huron Treaty and Williams Treaty areas.

Extensive communication has occurred with Algonquin communities, most notably, the Algonquins of Pikwakanagan, the Mattawa-North Bay Algonquins, and the Whitney Algonquins. These consultations occurred as part of the implementation of a Memorandum of Understanding (MOU). An Annual Work Schedule review meeting led by the Algonquin Forestry Authority (AFA) was held on March 19, 2001, to identify opportunities and discuss progress in implementing the MOU. Discussions of opportunities involved harvesting, silvicultural contracting, road maintenance and construction.

Forest resource allocations of 7,000 cubic metres annually were identified for each of the three First Nation communities in the MOU. In total 47,000 cubic metres have been harvested under the MOU during 2001/02. In addition, 5,146 hectares of tree marking were completed by Native contractors in 2001/02, and 49,000 seedlings were purchased from Cory Lake tree nursery, an enterprise of Makwa EDC, for planting in the spring of 2001. The total value of the contracts awarded to the Algonquin communities in 2001/02 amounted to $2.1 million.

Twenty-five Algonquin community members are employed in woodland operations. The AFA continues to enter contractual arrangements for silviculture jobs and data collection with individual Algonquins, and with community economic development corporations.

The AFA/MNR has offered to sponsor individuals from each community in forestry-related courses. The AFA holds various training sessions that native contractors attend, including topics such as tree marking, careful logging, water crossings and other on-site training. All contractors received training on AFA's Environmental Management System. These courses are also available to interested individuals from each community.

Three seats on the forest management planning team have been allocated to First Nations.

Bancroft District

Management units: Bancroft-Minden Forest and parts of Mazinaw-Lanark Forest

There are no First Nation communities in the Bancroft District. However, the Algonquin community has satellite communities in the Bancroft, Sharbot Lake, and Whitney areas, and the Pikwakanagan First Nation at Golden Lake has interests in the District.

Discussions of potential opportunities have occurred between the Bancroft Minden Forest Company Inc. and several First Nation communities and individuals. There are approximately seven Algonquin community members employed in logging and silviculture work, and an undetermined number employed at local mills. There is currently a First Nation representative on the Local Citizens Committee (LCC) in the Mazinaw-Lanark Management Unit.

Tree marking and boundary line establishment contracts have been issued to a First Nation company for 255 hectares. This also includes approximately 35 hours of boundary line establishment and 20 hours of tree marking.

The Algonquins of Whitney are members of independent licensees in the Bancroft-Minden SFL and have had a supply agreement to harvest 100 hectares per year.

The Pikwakanagan First Nation and the Algonquins of Sharbot Lake prepared local Native Background reports. The Pikwakanagan First Nation submitted a proposal for a training initiative that was supported by a local forest company.

Chapleau District

Management units: Superior Forest and Pineland-Martel Forest

The Brunswick House, Chapleau Cree, Chapleau Ojibway and Michipicoten First Nation are First Nation communities with a landbase in the Chapleau District. In addition the Missanabi Cree, Mississaugi and Sagamok Anishnabek First Nations all have traditional land use areas within the District.

The MNR participated in 13 meetings with the Missanabi Cree First Nation and Weyerhaeuser to identify initial interest in developing a Tripartite Forest Resource Agreement. The scoping exercise resulted in the first draft of the agreement, addressing issues that include economic development, training, consultation, and community infrastructure.

White Eagle Logging and Trucking Company of the Brunswick House First Nation received an allocation of 50,000 cubic metres of fibre from Domtar Inc.'s Pineland-Martel Forest. Domtar Inc. has provided significant support to White Eagle Logging and Trucking Company for this project. The company also undertook road and water crossing construction under the guidance of Domtar Inc. The MNR provided office space and systems support for a Brunswick House First Nation Economic Development Officer to prepare and submit to Natural Resources Canada a funding proposal in support of this project.

A Brunswick House First Nation member has also opened a small sawmill that currently processes large diameter conifers and underutilized species. Weyerhaeuser has committed 1,500 cubic metres of spruce, pine and fir for mill operations for this year.

The MNR has facilitated discussions with the community to help identify a source of fibre for the mill and to acquire a facilities licence.

Seven First Nation communities in Chapleau District ratified a Communication Protocol Agreement, negotiated last year to deal with issues including access to resource- based opportunities. The agreement included the Chapleau Ojibway, Chapleau Cree, Brunswick House, Missanabi Cree, Michipicoten, Mississauga, and Sagamok Anishnabek First Nation communities.

Chapleau District hosted a one-day Cross-Cultural Training session that was attended by local First Nation community members, MNR management and forest industry management personnel. First Nation community members and MNR staff also participated in four meetings to discuss the following issues: First Nations governance; MNR organizational structure; and MNR policy interpretation and development opportunities for the Chapleau Tree Nursery.

Chapleau District will explore development of an Aboriginal Strategy with First Nations to address mutual concerns, including T&C #77 opportunities.

Cochrane District

Management units: Cochrane Management Unit, Driftwood Forest, Iroquois Falls Forest, Moose River Management Unit, Smooth Rock Falls Forest

The seven First Nations in the Cochrane District are Attawapiskat, Fort Albany, Fort Severn, Kashechewan, Moose Cree, Taykwa Tagamou (formerly New Post), and Weenusk (Peawanuk). Mocreebec Council is also located within the District. Taykwa Tagamou is the only First Nation in Cochrane District located within the AOU. Moose Cree's traditional territory stretches south into the AOU. As well, Wahgoshig First Nation's traditional territories extend north from Kirkland Lake District into Cochrane District, and this First Nation is active in forest management discussions in the District.

Discussions between the Moose Cree, Taykwa Tagamou and Wahgoshig First Nations and the forest industry continue, focusing on developing silvicultural opportunities; specifically capacity in harvest, renewal, and planning. These three First Nations are also involved on forest management planning teams (Cochrane-Moose River Forest and Nighthawk Forest) and local First Nations Advisory Committees. The Moose Cree, Taykwa Tagamou and Wahgoshig First Nations are involved in SFL negotiations with the MNR and Tembec Industries Inc. for a co-operative SFL on the Cochrane and Moose River management units.

Discussions continue between the MNR and the Moose Cree First Nation on reaching a mutual agreement for community-based land use planning as part of the Northern Boreal Initiative. The MNR has provided funding in this area to assist with inventory work and feasibility studies. The Wahgoshig First Nation, Abitibi-Consolidated Inc., and the MNR have an agreement in place to address social, cultural and economic concerns (Iroquois Falls Forest). Bi-annual meetings have been held with Chiefs from the Moose Cree, Taykwa Tagamou and Wahgoshig First Nations regarding issues, opportunities and markets. Tembec Industries Inc. has a MOU with the Moose Cree and Taykwa Tagamou First Nations to collaborate on establishing a business and social relationship for mutual benefits. Tembec Industries Inc. also sponsored a trip to Saskatchewan where representatives from the Moose Cree First Nation and Tembec Industries Inc. staff examined First Nation involvement in all aspects of the local forest industry.

Norbord Industries has worked with the Taykwa Tagamou First Nation to provide harvesting opportunities on the Driftwood Forest. Tembec Industries Inc. and Abitibi-Consolidated Inc. entered into successful silvicultural contracts with the Wahgoshig and Taykwa Tagamou First Nations. Tembec Industries Inc. allocated harvest volumes to the Moose Cree First Nation (two blocks) and to the Taykwa Tagamou First Nation (37,305 cubic metres in the Cochrane management unit, 47,000 cubic metres in the Smooth Rock Falls Forest). The Wahgoshig First Nation successfully negotiated third- party licences on the Iroquois Falls Forest as part of an agreement with Abitibi-Consolidated Inc. The Taykwa Tagamou First Nation was awarded 3.6 kilometres of road building on the Smooth Rock Falls Forest. Tembec Industries Inc. and the Taykwa Tagamou First Nation explored the viability of a finger jointing plant for mill ends.

Norbord Inc. employed a member of the Taykwa Tagamou First Nation at its mill in Cochrane. One summer staff employee from Moose Cree First Nation worked six months on the Moose River Management Unit, and a summer staff employee from the Taykwa Tagamou First Nation worked four months on the Smooth Rock Falls Forest. Tembec Industries Inc. and the MNR jointly funded liaison positions at the Taykwa Tagamou and Wahgoshig First Nations. The Taykwa Tagamou Economic Development Corporation worked under contract for both Tembec Industries Inc. and Norbord Industries regarding harvest operations.

The Wahgoshig First Nation and Abitibi-Consolidated Inc. are co-operating on a survey of underutilized species on the Iroquois Falls Forest, and with the MNR are collaborating on values mapping on the Iroquois Falls Forest. The Wahgoshig , Moose

Cree and Taykwa Tagamou First Nations, the MNR and Tembec Industries Inc. are co-operating on values mapping and verification on the Moose River and Cochrane management units. Abitibi-Consolidated Inc. has provided computers and software to the Wahgoshig First Nation for use in forest management activities.

A working partnership agreement between the Wahgoshig First Nation and Abitibi-Consolidated Inc. provides targets for training opportunities, including funding for training, education, youth development, access upgrade, and implementation of the agreement. A draft working partnership agreement between the Moose Cree First Nation and Abitibi-Consolidated Inc. will fund training opportunities and address trapping issues, education and youth development, and enhanced forest management planning participation. Abitibi-Consolidated Inc. has provided financial support to several First Nation communities for various social events. Tembec Industries Inc. has a scholarship program for First Nations and has sponsored one Taykwa Tagamou First Nation member in the Aboriginal Resource Technician Program at Sault College.

Dryden District

Management units: Dryden Forest, Wabigoon Forest, and English River Forest

The Eagle Lake and Wabigoon Ojibway First Nations are located in the Dryden District. The Grassy Narrows, Lac Seul, Saugeen, Wabauskang , and Whitefish Bay First Nations are other First Nation communities with interest or ongoing activities in the District.

The president of the Aboriginal Peoples of Wabigoon served as acting chairman of the LCC during 2001/02.

In 2001/02, the Eagle Lake First Nation harvested 5,887 cubic metres of wood from 52.1 hectares of the Dryden Forest. In the same year, Wabigoon Metis, a Metis-owned business which is part of the Aboriginal Peoples of Wabigoon, harvested 4,526 cubic metres of wood on 59.7 hectares from the Forest. Noopimiing Anokeewin Inc., an Aboriginal-owned business that employs some Aboriginal people, harvested 2,470 cubic metres of wood from 76.9 hectares on the Dryden Forest. These harvested volumes did not match expected harvest volumes from the actual area harvested due to lower than expected yields per hectare and delayed deliveries of wood to the mill.

In its 2001-2021 FMP Summary, the Dryden Forest Management Company Ltd. states that, "7.4 percent of the harvest allocations (determined by controlling interest in the company) are held by Aboriginals or aboriginal partnership" within the SFL, in addition to the 13.11 percent share of the allocation held by Aboriginal people through overlapping licences. Specific harvest volume and silviculture were not provided for 2001/02. The MNR continues to make efforts to inform the Eagle Lake First Nation, the Aboriginal Peoples of Wabigoon and Noopimiing Anokeewin Inc. about the opportunities made available through membership in the SFL.

The Dryden Forest Management Company Ltd. negotiated an agreement to purchase up to 40 percent of its annual requirements for nursery seedlings from the Wabigoon First Nation Tree nursery facility.

Fort Frances District

Management units: Sapawe Forest, Highrock Forest, and Fort Frances-Flanders Forest

The First Nations located in the Fort Frances District are Big Grassy, Big Island, Couchiching, Lac La Croix, Naicatchewenin, Nicickousemenecaning, Rainy River, Seine River and Stanjikoming. The Whitefish Bay and Onegaming First Nations are located outside of the border of the District, but their traditional territories extend into it. Lac des Mille Lacs First Nations has an uninhabited reserve adjacent to the Sapawe Forest.

Consultations regarding forest management planning for the new Crossroute Forest took place, with the majority of the First Nations communities participating. All 11 First Nation communities within and adjacent to the Management Unit were invited to participate. They have been advised of the native consultation process option and of the required na-

tive values collection. There has been no expressed interest in harvesting or other forestry opportunities for First Nations people adjacent to the Sapawe Forest.

Within the Fort Frances-Flanders Forest management unit, a total of eight separate harvesting licences were issued, for a combined harvest allocation of 104,811 cubic metres (2,929.5 hectares). In addition, several contracts were issued to the Naicatchewenin First Nation for mechanical site preparation, road construction and forest management. An individual from Rainy River received a contract for thinning. The Seine River First Nation received contracts for road construction and thinning. Individuals from the Couchiching and Lac La Croix First Nations received contracts for trucking. Employment estimates for the Fort Frances-Flanders Forests include approximately 62 First Nation members working in the activities mentioned above. In addition, an unknown number of First Nation employees work for Manitou Lumber. The Rainy River First Nation is part owner of the mill which is partly located on the community's land. An agreement with management of the mill provides opportunity for the employment of First Nation members.

2001/02 was the fourth year of a signed MOU between the MNR and the Naicatchewenin First Nation, regarding mutual concerns respecting the management of natural resources in the Loonhaunt Area. The Gamongi'ikok Committee of the Naicatchewenin First Nation initiated a draft Terms of Reference that included forest management planning information for the Area. In mid 2001, restructuring of the Naicatchewenin First Nation occurred, and the community has not yet advised the MNR on how it wishes to proceed with the agreement.

There are three First Nation logging contractors operating within the Highrock Forest, with a total allocation of 51,000 cubic metres of wood. In addition, a licence has been issued to Turtle Island Log Homes, a native-owned log home business. Additional contracts by Abitibi-Consolidated included two thinning contracts and a $250,000 road maintenance contract. Abitibi's silviculture contractor also employs First Nation community members for cone collection. In total, approximately 95 First Nation members are employed in bush and mill operations within the Highrock Forest.

Hearst District

Management units: Gordon Cosens Forest and Hearst Forest

Constance Lake is the only First Nation community in the District. The Hornepayne, Moose Cree and Taykwa Tagamou First Nations also have interests within the District.

Efforts to negotiate an Agreement of Co-existence between Constance Lake First Nation, the forest industry, and the federal and Ontario governments have been ongoing since 1997. The agreement remains unsigned and new discussions outside of the context of the Agreement are scheduled for the fall of 2003 with the forest industry and Constance Lake First Nation. Although the agreement remains unsigned, some accomplishments envisioned in it are progressing.

The following initiatives outline key efforts to advance economic development opportunities for Aboriginal people in the Hearst District:

Mammamatawa Inc. is a First Nations logging business that recently partnered with a major company in the region, Villeneuve Construction Co. Ltd., to advance its business planning goals. It employs approximately 20 full- and part-time Aboriginal employees for work on the Hearst Forest, and an additional five individuals for work performed on the Gordon Cosens Forest. Constance Lake First Nation, through Mammamatawa Inc., was issued a yearly allocation of 13,030 cubic metres of wood on the Hearst Forest. Mammamatawa also harvested roughly 87,000 cubic metres of wood in 2001/02. First Nations Timber Ltd. of Kapuskasing harvested approximately 60,000 cubic metres in 2001/02 for Spruce Falls (Tembec Industries Inc.).

Hearst Forest Management Inc. has communicated opportunities for forest management work to Constance Lake First Nation. Hearst Forest Management Inc. and Spruce Falls have facilitated training and harvesting opportunities in the Hearst and Gordon Cosens Forests. In 2001, Constance Lake First Nations had a contract to plant 750,000 trees.

Constance Lake First Nation community members also harvested the majority of the 2001 cone collection, and community members were hired for slash pile burning, timber cruising and other forest management work.

The MNR and Hearst Forest Management Inc. continue to invest in a scholarship program that supports First Nations students pursuing careers in resource management.

Co-existence discussions and other committee dialogue on how to increase employment opportunities in the forest sector and other sectors of the economy are ongoing. The workforce at the local Lecours Lumber sawmill is comprised of approximately 50 percent First Nations individuals, or about 65 employees. Two other sawmills in the area have initiatives to employ First Nations people. The MNR employs First Nation students for summer seasonal work and contract employees to lead various projects.

Through discussions with the Constance Lake First Nation, the MNR has supported a Native Values Office on the reserve. The facility belongs to the First Nation, and the MNR has hired a number of First Nations members to help with the Northern Boreal Initiative, forest management planning and Ontario's Living Legacy.

Partnerships to establish the Nagagamisis Signature Site have led to new economic development opportunities for the Constance Lake First Nation. The Eagle's Earth Historical Centre, a world-class destination tourism facility, will be constructed on Highway 11 near the Shekak River within the Hearst Forest. The MNR, the Ministry of Northern Development and Mines and the federal government are partners in assisting the Eagle's Earth Board of Directors with development of the First Nations tourism centre, a $10 million capital investment that will create 30 jobs. The business plan calls for the development of revenue opportunities including a convention centre, a RV park, cabin rental units, powwow grounds, an art gallery, a restaurant, and other amenities. It will be constructed in 2004 and operational by 2005. The value of First Nations culture is an important theme and may lead to other opportunities to enhance cultural values and knowledge of the area. A cultural inventory of the Nagagamisis Signature Site completed in 2002 complements traditional knowledge and recounts 7,000 years of history.

Kemptville District

Management units: parts of Mazinaw-Lanark Forest

The Mohawk Council of Akwesasne and the Algonquins of Ottawa and Sharbot Lake hold regular discussions on forest management opportunities. A member representing the Algonquin communities participates on the LCC. The District continues to encourage and support these efforts to become more involved in the forest industry.

There were no contracts, licences or allocations designated in this District during 2001/02.

Kenora District

Management units: Kenora Management Unit and Whiskey Jack Forest

The 12 First Nation communities located in the Kenora District are Dalles, Grassy Narrows, Northwest Angle #33, Northwest Angle #37, Ojibways of Onegaming, Iskutewisakaygun, Shoal Lake #40, Wabaseemoong, Wabauskang, Washagamis Bay, Wauzhushk Onigum and Whitefish Bay First Nations. Big Grassy and Big Island First Nations are located in the Fort Frances District, but have reserve lands and an interest in resource planning in the Kenora District.

There is a First Nation member on the LCC. Discussions between First Nations, the MNR and Weyerhaeuser continue, with topics including the issuance of a SFL to Weyerhaeuser for the Kenora Management Unit. Weyerhaeuser has held numerous meetings and consultations with Treaty #3 First Nations, and has negotiated a number of agreements and MOU's.

Three First Nations have access to Forest Resource Licences (FRLs), although one, Shoal Lake 40, has not exercised this opportunity in recent years. The Iskutewisakaygun (Shoal Lake 39) First Nation has a licence to harvest of 2,407 cubic metres of conifer per year. The Wabaseemoong Independent Nation has an allocation of 7,221 cubic metres of conifer per

year. As well, a number of First Nations individuals were hired at the new Trus Joint Plant during construction. These individuals continue to be employed at the new mill.

Contracts were granted on the Kenora Management Unit for pre-commercial thinning and mechanical cleaning that provided a total of 170 person-days work to First Nation individuals. In addition, contracts for tree planting (90 person-days) and slash pile burning (12 person-days) employed workforces consisting of 25 percent and 50 percent First Nation individuals respectively.

Kirkland Lake District

Management units: Timiskaming Forest and part of Iroquois Falls Forest

There are two First Nation communities, Wahgoshig and Matachewan, located within Kirkland Lake District and one Aboriginal community (Beaverhouse). The Temagami and Mattagami First Nations are located outside of the District but have an interest in forest management within the District.

Discussions focused primarily on silvicultural opportunities leading to potential harvesting contracts continue between First Nations and industry. The Wahgoshig First Nation is continuing discussions with Timiskaming Forest Alliance Inc. and the MNR to negotiate an agreement on economic opportunities from all aspects of forest planning and management. Discussions between the Wahgoshig First Nation and Abitibi Consolidated Inc. are ongoing, with a focus on developing capacity in harvesting, renewal and tree planting. The Matachewan First Nation is in the initial stages of discussion with Timiskaming Forest Alliance Inc. to develop a long-term agreement for horse logging applications in the Timiskaming Forest, while the Temagami First Nation is discussing tree planting opportunities with individual shareholders in the Alliance. The Beaverhouse Aboriginal Community is in the early stages of discussion with Abitibi Consolidated Inc. on improving opportunities, primarily in silviculture. As a result of a District strategy (*Management of Crown Timber on Patented Lands*), significant progress has been made on establishing partnerships between local First Nations and forest industry to harvest All Trees Reserved on private lands.

The Wahgoshig First Nation, Abitibi Consolidated Inc. and the MNR have an agreement in place for the Iroquois Falls Forest to address social, cultural and economic concerns. The Wahgoshig First Nation has a MOU with Tembec Industries Inc. to collaborate and establish a business and social relationship for mutual benefits. The MNR has been working with individual shareholders of Timiskaming Forest Alliance Inc. to identify potential opportunities for working with local First Nations.

The Matachewan First Nation has obtained an overlapping licence for a horse-logging operation to harvest 720 cubic metres, with a value of $17,266, in the Timiskaming Forest. The Wahgoshig First Nation negotiated third-party licences on the Iroquois Falls Forest as part of their agreement with Abitibi Consolidated Inc. Thirteen individuals from the Matachewan First Nation and 13 from the Wahgoshig First Nation were hired by Timiskaming Forest Alliance Inc. for tree planting, while seven individuals from the Matachewan First Nation and 10 from the Wahgoshig First Nation were hired for thinning operations. A Matachewan First Nation certified heavy truck operator is hauling wood on contract for a shareholder in the Alliance. The Timiskaming Forest Alliance Inc. issued pre-commercial thinning contracts to the Wahgoshig First Nation for 502 hectares and to the Matachewan First Nation for 250 hectares, and tree planting contracts to the Wahgoshig First Nation for 249,704 trees and to the Matachewan First Nation for 247,224 trees.

MNR staff have held meetings with each First Nation to review Annual Work Schedule maps for the Timiskaming FMP, and to determine protection for any impacted values. The Wahgoshig First Nation and Abitibi-Consolidated Inc. are co-operating on a survey of underutilized species on the Iroquois Falls Forest, while the MNR is cooperating with these two parties on values mapping for the Iroquois Falls Forest. The MNR, Timiskaming Forest Alliance Inc. and Beaverhouse Aboriginal Community have completed a values verification project and are progressing on digitizing the values information. The Matachewan

First Nation and Timiskaming Forest Alliance Inc. are co-operating on verifying values information in the field. The MNR is providing assistance to the Matachewan First Nation to establish a community archive of values information. The Matachewan First Nation Liaison Position has been involved in all aspects of values collection, reporting and protection.

The MNR is working with Timiskaming Forest Alliance Inc. to explore opportunities for delivering hands-on GIS training to members of local First Nations in order to improve their capacity to interpret maps and understand the forest management planning process. The MNR sponsored a GIS training session attended by members of the Matachewan and Wahgoshig First Nations and the Beaverhouse Aboriginal Community, and provided funding support for First Nation community members to attend an MNR training session on slash pile burning. An Aboriginal Resource Technician from the Matachewan First Nation was sponsored by Timiskaming Forest Alliance Inc. at Sault College. A working partnership agreement between the Wahgoshig First Nation and Abitibi Consolidated Inc. provides targets for training opportunities, including funding for training, education, youth development, access upgrade, and implementation of the agreement. Abitibi-Consolidated Inc. has provided computer and software to the Wahgoshig First Nation for use in forest management planning activities.

Nipigon District

Management units: Lake Nipigon Forest, Nakina North Forest, Kenogami Forest, Ogoki Forest, Pic River Ojibway Forest, parts of Black Sturgeon Forest and Lakehead Forest

The First Nations located in the Nipigon District are Animbiigoo Zaagi'igan Anishinaabek, Aroland, Biinjtiwaabik Zaaging Anishinaabek, Eabametoong, Ginoogaming, Kasabonika Lake, Long Lake #58, Marten Falls, Neskantaga (formerly Landsdowne House), Nibinamik, Ojibways of the Pic River, Pays Plat, Red Rock, Sand Point, Wawakapewin and Webequie First Nations. However, Kasabonika Lake, Nibinamik, Neskantaga, Wawakapewin and Webequie First Nations are north of the AOU. The Constance Lake, Fort William, Gull Bay and Whitesand First Nations have traditional lands within the Nipigon District.

Animbiigoo Zaagi'igan Anishinaabek continued participation on the Lake Nipigon Forest planning team, and a member of the community continues to actively participate on the Nipigon East Area LCC. A FRL for the Lake Nipigon Forest was issued to the Animbiigoo Zaagi'igan Anishinaabek First Nation, with an annual commitment in the 2001 FMP of 14,530 cubic metres. In addition to this regular harvest licensing, Animbiigoo Zaagi'igan Anishinaabek participated in the salvage harvest of the 1999 Beardmore Fire (51,935 cubic metres). The First Nation also completed tree planting as well as tending and thinning operations.

The Aroland, Eabametoong and Marten Falls First Nations are involved in advanced stages of discussion regarding harvesting, tree planting and site preparation opportunities in the Nakina North and Ogoki Forests. Each of the three First Nations has representation on the Three Nations Management Inc. Board of Directors. Three Nations Management Inc. supports the development of First Nations harvesting companies by creating business plans, identifying funding opportunities, and providing a significant training program for existing and potential employees in the harvesting operations. The General Manager of Three Nations Management Inc. acts as First Nations representative on the 2003 forest management planning team for Ogoki Forest. All three communities agreed to participate in the Native Consultation process for the development of the 2003-2023 Ogoki FMP. Each community hosted a First Information Centre for the 2003 Ogoki FMP. An elder from the Aroland First Nation is participating in the First Nation Values data collection for the Kenogami Forest. The Aroland First Nation was issued a licence to harvest 42,445 cubic metres from the Nakina North Forest in 2001/02. The Eabametoong First Nation was issued a licence to harvest 63,014 cubic metres from the Ogoki Forest, while the Marten Falls First Nation received a licence to harvest

40,357cubic metres from the Ogoki Forest. The native component of the site preparation contractors program that began in 1999/00 for the Nakina North/ Ogoki Forest continued into 2001/02. Some progress was also made in developing community interest in tree planting work through the contractors selected by Long Lake Forest Products to carry out the spring tree plant.

Biinjtiwaabik Zaaging Anishinaabek has representation on the Black Sturgeon forest management planning team. The First Nation had discussions with the MNR about forestry licensing opportunities on this forest. After entering into a "Protocol of Co-operation" with Domtar Inc., Biinjtiwaabik Zaaging Anishinaabek continued negotiations towards a long-term Memorandum of Agreement. Biinjtiwaabik Zaaging Anishinaabek has a MOU with Bowater Inc. for 60,000 cubic metres per year on the Black Sturgeon Forest, but a licence to harvest has not yet been negotiated. A FRL for the Lake Nipigon Forest was issued to the Biinjtiwaabik Zaaging Anishinaabek First Nation, with an annual commitment in the 2001 FMP of 58,860 cubic metres. In addition to this regular harvest licensing, Biinjtiwaabik Zaaging Anishinaabek participated in the salvage harvest of the 1999 Beardmore Fire (28,833 cubic metres). The First Nation also completed tree planting as well as tending, spacing and thinning operations, and carried out a Heavy Equipment Training Program. A community contractor completed a spacing contract on the Black Sturgeon Forest.

The Constance Lake First Nation is harvesting on the Kenogami Forest, operating as a second party to Kimberly Clark Inc. In 2001/02, this First Nation had a harvest allocation of 75,000 cubic metres.

A consultant on the Lakehead forest management planning team is representing the Fort William First Nation.

The Ginoogaming First Nation continued to have community members working at Long Lake Forest Products Mill. Residents also continue to be employed in the Kimberly Clark Inc. woodlands. The Ginoogaming community is participating in the First Nation Values data collection for the Kenogami Forest.

The Gull Bay First Nation has an overlapping licence on the Black Sturgeon Forest, with an allocation of 108,788 cubic metres in 2001/02. Gull Bay First Nation contractors entered into a number of contracts with Bowater Inc. for tree planting and juvenile spacing. Community members carried out these contracts. As well, the First Nation itself had a tree-planting contract.

The Long Lake #58 First Nation community is participating in First Nation Values data collection for the Kenogami Forest. Residents are also employed in the Kimberly Clark Inc. Woodlands.

The Ojibways of Pic River First Nation has a development corporation with a Manager of Operations who participates as a member of both the planning team and LCC for the Pic River Ojibway Forest. The Pic River Development Corporation, with its overlapping FRL, is in advanced discussions with Great West Timber regarding wood supply, silviculture, licence volumes and job creation. The wood allocation volume was 52,291 cubic metres in 2001/ 02. The Ojibways of Pic River First Nation had ten Category 2 fire crews that were successfully employed by the MNR in forest fire suppression.

A Pays Plat First Nation member is a participant in the Kenogami forest management planning team.

The Red Rock First Nation has an active member on the Lake Nipigon East Area LCC and continues to participate in the 2001 Lake Nipigon forest management planning team. A consultant is representing the Red Rock First Nation on the Lakehead forest management planning team and negotiations continue for identification of harvest areas. A FRL for the Lake Nipigon Forest was issued to the Red Rock First Nation, with an annual commitment in the 2001 FMP of 69,790 cubic metres. In addition to this regular harvest licensing, the Red Rock First Nation participated in the salvage harvest(12,759 cubic metres) of the 1999 Beardmore Fire. Negotiations continue with Greenmantle Forest Inc. for a 25 hectare licence to harvest on the Lakehead Forest.

The Sand Point First Nation had preliminary discussions with Domtar Inc. regarding potential opportunities.

The Whitesand First Nation held contracts with Bowater Inc. for the first time for tree planting and

stand spacing work in the Black Sturgeon Forest. The First Nation also had discussions with Bowater Inc. regarding obtaining a timber harvesting licence.

Niigaani Enterprises is an Aboriginal-owned and operated logging company that harvested 230 hectares of green wood and 2,764 hectares of salvage wood on the Black Sturgeon Forest under an overlapping FRL.

Kimberly Clark Inc., Longlac Wood Industries Inc., Columbia Forest Products, and Lecours Lumber Co. Ltd made available silvicultural contracts, which included thinning, tree planting, Free-To-Grow assessments, spacing, nursery stock production and cone collection on the Kenogami Forest. Kimberly Clark Inc. directly employs a number of First Nation members within its operations. Domtar Inc. offers additional silvicultural opportunities for First Nations in the Lake Nipigon and Auden Forests.

North Bay District

Management units: Temagami Management Unit, Nipissing Forest

The Antoine Algonquin, Dokis, Mattawa North Bay Algonquins, Nipissing, and Temagami First Nations have communities located within the North Bay District. They continue to participate in the North Bay District Aboriginal Working Group.

Four District Aboriginal Working Group sessions were held in 2001/02, regarding resource and economic issues and training needs. The SFL holder, Nipissing Forest Resource Management Inc., has collaborated with the District Aboriginal Working Group on an ongoing basis. Discussions regarding forestry opportunities are at an advanced stage, and all five First Nations are interested in potential opportunities in the forest sector. The First Nations have participated in several meetings with members of the forest industry and the MNR to discuss potential involvement in the forestry business sector. Discussions have focused on potential job opportunities through silvicultural contracting and harvest opportunities on existing industry licence areas.

In 2001/02, the Nipissing First Nation finalized the first FMP (2001-2021) for Nipissing Reserve. The Nipissing First Nation hired Cutter Forestry Consulting to develop and implement a forestry program both on and off reserve. The Nipissing First Nation is co-owner of Nbisiing Forestry Inc., which holds the FRL formerly held by Beaucage and Sons. The Nipissing First Nation harvested a significant portion of its allocation, harvesting 11,654 cubic metres by hiring an outside contractor using Nipissing First Nation community members on harvesting equipment. Nbisiing Forestry Inc. also oversees harvest operations on the reserve.

The Temagami First Nation is an active member of the forest management planning teams for both the Temagami Crown Management Unit and the Nipissing Forest. The Temagami First Nation, under the final year of a three-year Forestry Futures Trust Fund contract, completed 311.8 hectares of manual tending at a value of $107,102, and 404.6 hectares of pre-commercial thinning for a value of $182,070. Manual tending for Grant Forest Products was also carried out. Temagami Cedar, a private company at the Temagami First Nation, provides two full-time jobs and has an allocation of 3,000 cubic metres of cedar for custom milling.

The Dokis First Nation received a four-year overlapping FRL in 2001/02. Work centred on successfully obtaining approval for the installation of a bridge to allow access to available harvest area. Twelve individuals were employed in 2001/02, and 1,950 cubic metres of wood were harvested. A wood purchase agreement was developed to supply the Tembec Industries Inc. Mattawa sawmill with timber cut from the Dokis First Nation's Crown allocation. The Dokis First Nation spent considerable effort over the past two years preparing a FMP to help regulate harvesting on their reserve lands. They have placed a moratorium on all logging on the reserve until it is approved.

The Mattawa North Bay Algonquins, through their ownership of Madajiwan Economic Development Corporation, continued operations on their overlapping FRL, harvesting 15,735 cubic metres. There were up to 15 First Nations individuals involved in bush operations.

The Antoine Algonquin First Nation has been working closely with the MNR, Tembec Industries

Inc. and Nipissing Forest Resource Management Inc. to develop a sugar bush project in the Mattawa area.

First Nations and the MNR continued investigating opportunities to establish a greenhouse to produce tree seedlings for the Nipissing Forest. All five First Nations participated in a two-day trip, funded by the MNR, to nurseries in Northern Ontario to explore economic opportunities. The three-year Loring Deer Yard Stand Improvement project in Nipissing Forest is specifically aimed at providing 25 jobs for Aboriginal people in several communities, including the Temagami First Nation. Brush saw certification and chainsaw training opportunities for 25 First Nation individuals, to provide capacity for work on the Loring Deer Yard project, were provided by the MNR and co-ordinated by Nipissing Forest Resource Management Inc.

Parry Sound District

Management unit: French-Severn Forest

The six First Nations located in the Parry Sound District are Henvey Inlet, Magnetawan, Moose Deer Point, Shawanaga, Wahta Mohawks, and Wasauksing. As well, the Dokis First Nation, adjacent to the French-Severn Forest, is active in forest management in the District.

A District Native Liaison Officer communicates regularly with the First Nations communities on a variety of topics, including forestry opportunities. The First Nations were contacted by the District as part of Annual Work Schedule review. Westwind Forest Stewardship Inc. also holds a meeting annually with local First Nations. Limited Crown resources, as well as ongoing land claims and fully allocated harvest areas, provide few forestry opportunities for First Nations within this District.

Negotiations have been initiated to allocate a small surplus of timber. A portion of this allocation was successfully allocated but not licensed to the Dokis First Nation. The Dokis, Henvey Inlet and Magnetawan First Nations had silvicultural contracts with the SFL holder, with training supplied, for brush saw work.

The Henvey Inlet, Dokis, Magnetawan and Shawanaga First Nations have completed Native Values Background Reports.

A forest technician from the Henvey Inlet First Nation is collecting native values data and assisting Westwind Forest Stewardship Inc. with compliance. This individual is also on the forest management planning team and receives some training and development from Westwind Forest Stewardship Inc.

The Shawanaga First Nation has a member participating on the LCC. The First Nation has a technician who is assisting the MNR with bear population surveys.

A member of the Wahta First Nation received some training at the MNR District office via the Aboriginal Technician Program at Sault College.

Discussions continue to identify future opportunities in the forestry sector for the First Nations within this District, including training and development opportunities.

Pembroke District

Management unit: Ottawa Valley Forest

There are several Algonquin communities within the Pembroke District. The Algonquins of Pikwakanagan at Golden Lake is the only Indian Reservation designated under the Indian Act. However, there are several Algonquin communities in the District that are known as off-reserve Algonquin communities. These communities are contained within established communities like Killaloe, Petawawa and Renfrew. While there are several off-reserve communities within Pembroke District, only the Algonquins of Pikwakanagan through the Makwa Community Development Corporation Inc. is active in forest activities. Pembroke District also works with the Mattawa-North Bay Algonquins, an off-reserve Algonquin community that is located in North Bay District, but is involved in Forest Management activities in Pembroke District.

The District is continuing discussions with the Algonquins of Pikwakanagan and the Mattawa-North Bay Algonquins. Discussions have resulted

in the completion of Native Values maps and background reports representing three communities, and identifying issues and opportunities.

The Algonquins of Pikwakanagan, through an affiliated company, Makwa Community Development Corporation Inc., have maintained an overlapping FRL and Associate Partner status on the SFL since 1996. Results of negotiations have led to silvicultural contracts for harvest prescriptions, layout, tree marking, stand improvement, tending, pruning, data collection, and the production of nursery stock. A further benefit of these contracts includes the employment of Aboriginal individuals from the Greater Golden Lake Region. Harvest allocation to the Algonquins of Pikwakanagan was 582 cubic metres. During this period, harvest plans were postponed due to access problems with an allocated winter harvest block.

Two Aboriginal businesses involved with forestry operations on the Ottawa Valley Forest are Randy Commanda Forestry Services, and Kakina Forestry and Consulting Services. Under contract, Randy Commanda Forestry Services harvested 2,610 cubic metres on a 45-hectare harvest block, and also tree-marked 150 hectares in partnership with Reserve Forestry and Guiding. Kakina Forestry and Consulting Services was contracted for 198 hectares of tree marking, and also conducted post-cut surveys and regeneration assessments on the final 155 hectares of an 8,000-hectare contract. It is estimated that 25 Aboriginal workers were directly employed in the forest sector in the Pembroke District.

Ottawa Valley Forest Inc. has been in advanced discussions with Aboriginal communities and has identified potential opportunities, including silvicultural contracts for harvest prescriptions, layout, tree marking, stand improvement, tending, pruning, data collection, and the production of nursery stock. Three meetings in the 2001/02 fiscal year resulted in contracts to conduct tree marking, stand improvement and forest compliance on the overlapping licence.

Ottawa Valley Forest Inc., with participation by Algonquin communities, finalized the *Protocol for Identification and Facilitation of the Collection of Birch Bark and Cedar*. Ottawa Valley Forest Inc. conducted on-site training for Aboriginal tree markers, and two Algonquin forestry workers attended an Ottawa Valley Forest Inc. compliance training workshop. Ottawa Valley Forest Inc. has also offered to work with local communities to develop training plans and provide employment opportunities designed to build understanding and capacity.

Red Lake District

Management units: Trout Lake Forest, Red Lake Forest and Whiskey Jack Forest

(Management for the Whiskey Jack Forest is administered by Kenora District)

The Deer Lake, Kee Way Win, MacDowell Lake, North Spirit Lake, Pikangikum, Poplar Hill, and Sandy Lake First Nations are located in the Red Lake District. All seven communities are remote, with winter access only, and are not located within designated district forest management units. However, forest operations are carried out within the traditional use areas of the Cat Lake, Pikangikum, Wabauskang, Slate Falls, Grassy Narrows, and Lac Seul First Nations, as well as the local Aboriginal people living off-reserve in the communities of Red Lake and Ear Falls.

The Pikangikum First Nation has met regularly with the MNR and local forest companies regarding proposed changes to the Red Lake Forest Management unit. Discussions are ongoing regarding the development of an SFL for this First Nation, under the Northern Boreal Initiative.

Weyerhaeuser is in regular contact with the Lac Seul First Nation regarding wood purchasing and silvicultural contracts for the Wabigoon Forest. Silvicultural opportunities have also been offered to other local First Nations communities.

The Red Lake Forest Management Company has a formal standing offer with the Pikangikum First Nation for silviculture work, including tree planting, cone picking, thinning etc. A nuisance beaver removal contract with the Native Trappers Council is also ongoing, which provides opportunities for three or four First Nation members. Local First Nations completed a contract to collect Native Values information in the Red Lake Forest. An estimated 50 Abo-

riginal workers are employed in saw mills and bush operations in the Red Lake District.

Pikangikum First Nation students were involved in data collection for the Northern Boreal Initiative. The Red Lake Forest Management Company has offered training regarding harvest operations, road construction, and millwork to local First Nations.

Sault Ste. Marie District

Management units: Algoma Forest and parts of Northshore Forest

The Garden River, Mississauga, Ojibways of Batchewana, Serpent River, and Thessalon First Nations are located within the Sault Ste. Marie District. The North Shore Tribal Council is also active within the District.

Representatives from eight First Nation communities were involved in a white birch bark workshop hosted by the Serpent River First Nation in partnership with Rejean Cyr Logging. This two-day event is to be the First Annual Non-Timber Forest Products Workshop. First Nation communities in the District also expressed interest in various training opportunities and workshops including training in forest mensuration, fire, water crossing, fish habitat, GIS/GPS, MNR Lands Certification Courses, and Parks management.

The Robinson-Huron Forestry Company was issued two FRLs for harvesting a total of 733 hectares on the Sault Ste Marie portion of the Northshore Forest. The MNR met with a Garden River First Nation member to discuss the commitment of 10,000 cubic metres of low-grade hardwood upon production of an acceptable business plan.

Contracts totalling $215,000 were negotiated on the Northshore Forest (both Sault Ste Marie and Sudbury portions) for tree planting, manual cleaning, cone collection, and regeneration assessments. In the Sault Ste. Marie District the North Shore Tribal Council was awarded a contract for 277 hectolitres of cone collection and a contract for 1000 hectares of regeneration assessments. The Mississauga First Nation was awarded a contract for 61 hectares of manual cleaning and a contract to plant 84,000 trees.

The MNR assisted the Mississauga First Nation with the development of an Aboriginal Conservation Officer Program and trained two Deputy Conservation Officers from local First Nation communities. The MNR also provided numerous maps to the Birch Island, Sagamok, Serpent River, Mississauga, Thessalon, Garden River and Batchewana First Nations as well as the Mitigaawaki Forestry Co-operative Inc.

A Sault College Aboriginal Resource Technician Program co-op student participated in a four-month placement at Clergue Forest Management Inc. and at the Sault Ste. Marie District Office. The Sault Ste. Marie District had a First Nations Liaison position for six months to work with First Nations within the District to increase communication and identify mutually beneficial opportunities.

Sioux Lookout District

Management units: Caribou Forest and Lac Seul Forest

There are 14 First Nations communities situated in the Sioux Lookout District, of which only three (Lac Seul, New Slate Falls, and the Ojibway Nation of Saugeen) are located within the AOU. Mishkeegogamang (Osnaburgh) and Cat Lake have some of their traditional lands within these forest management units.

Forest management planning for the Lac Seul Forest continues with input from the New Slate Falls, Cat Lake and Lac Seul First Nations. Native Background Reports were supplied to all three communities. Negotiations continue between New Slate Falls and McKenzie Forest Products Inc. regarding operations near the community, and developing an operational business arrangement which would include harvest and road construction activities adjacent to the community.

The Lac Seul First Nation has had a harvesting contract with McKenzie Forest Products Inc. on the Lac Seul Forest for many years, but the volume of wood cut has been low. The First Nation and McKenzie Forest Products Inc. continue to negotiate a Forest Operations Agreement. An estimated

60 First Nation workers are employed in McKenzie Forest Products Inc. mill and bush operations.

Forest management planning for the Caribou Forest also continues with varying degrees of input from the Mishkeegogamang First Nation and the Ojibway Nation of the Saugeen Band. The Mishkeegogamang First Nation has a member sitting on the forest management planning team. The MNR and the Mishkeegogamang First Nation entered into an agreement, with the MNR providing funding for the collection and summary of First Nation Values on the Caribou Forest. Numerous meetings between the MNR and the Mishkeegogamang First Nation were held on the FMP and community concerns. The Saugeen First Nation has indicated to the MNR that it does not recognise the FMP process and will not be participating in the development of the 2002/03 FMP for the Caribou Forest. Saugeen plans to develop and submit its own Resource Management Plan.

Bowater Pulp and Paper Ltd. has had a number of capacity building meetings with the Mishkeegogamang First Nation, and several meetings with the Ojibway Nation of the Saugeen Band concerning forest management opportunities. Bowater also continued the First Nations Junior Ranger Program, with members from both the Ojibway Nation of the Saugeen Band and the Mishkeegogamang First Nation participating.

Sudbury District

Management units: Sudbury Forest, Spanish Forest and part of Northshore Forest

The ten First Nations within Sudbury District are: Zhiibaahaasing, Sagamok Anishnawbek, Sheguiandah, Sheshegwaning, Ojibways of Sucker Creek, Wahnapitae, M'Chigeeng, Whitefish Lake, Wauwauskinga, and Wikwemikong. Adjacent communities of Henvey Inlet and Dokis First Nations are active in the District.

The SFL holders in the Sudbury District - Vermilion Forest Management Company Ltd. (Sudbury Forest), Northshore Forest Inc. (Northshore Forest) and Domtar Inc. (Spanish Forest) - continue to meet with First Nations communities and individuals to identify and negotiate opportunities and benefits from forest management activities.

The Sagamok Anishnawbek First Nation was granted a four-year FRL with yearly harvest allocation of 45,900 cubic metres plus an additional one-year licence for 10,100 cubic metres on the Northshore Forest. The Northshore Forest also granted a four-year FRL to the 10 First Nations within the District at a yearly harvest allocation of 55,400 cubic metres. An overlapping FRL was issued to N'Swakamok, a coalition of the Wahnapitae, Wikwemikong, Whitefish Lake, Henvey Inlet and Dokis First Nations, for an expected harvest of 48,300 cubic metres annually.

The Sagamok Anishnawbek First Nation was awarded contracts for 40 hectares of manual cleaning, 83 hectares of juvenile spacing, 30 hectares of manual chemical tending, and the planting of 453,000 trees on the Northshore Forest. The Dokis First Nation was contracted for manual tending of 10.5 hectares and 35.4 hectares of chemical tending on the Sudbury Forest. The Wikwemikong First Nation completed 569.3 hectares of tree marking on the Sudbury Forest. Domtar Inc. also provided a 350-hectare pre-commercial thinning contract on the Spanish Forest to a Wikwemikong First Nation contractor. Vermilion Forest Management Company Ltd. awarded a Wikwemikong First Nations firm a 1,421,302-tree contract on the Sudbury Forest.

Domtar Inc. hired a Wikwemikong First Nation forest student on a nine-month contract position. Domtar Inc. also provided two job-shadowing opportunities in GIS to individuals from Wikwemikong First Nation. Vermilion Forest Management Company Ltd. supported the certification of seven Dokis First Nation workers in Pesticide Technician training, and also provided the Whitefish Lake First Nation with 37 co-operative days in Aboriginal Resource Technician Program Placement.

The M'Chigeeng First Nation, United Chiefs and Councils of Manitoulin, and the MNR worked jointly to locate and facilitate the collection of traditional herbal medicines on an area of the Northshore Forest.

The Sudbury District completed the field audit for the Tree Marking certification of two Wikwemikong First Nation individuals, and also hired an Aboriginal Technician from Wahnapitae First Nation for 28 weeks. The District provided short-term employment for wildlife control to two individuals from M'Chigeeng First Nation, and GIS training for two weeks was provided to two members of the Wikwemikong First Nation. An MNR biologist was made available to all District First Nations for five months.

Thunder Bay District

Management units: Armstrong Forest, Brightsand Forest, Dog River-Matawin Forest, Kiashke River Management Unit, Lakehead Forest and Spruce River Forest

The four First Nations located within Thunder Bay District are Fort William, Whitesand, Lac Des Mille Lacs and Gull Bay. In addition, a Metis organization and a number of Aboriginal communities, including the Red Rock First Nation, Collins community, and the Thunder Bay Council of the Metis Nation of Ontario, have been involved in forest management within the District.

The Whitesand First Nation is a member of the forest management planning team for the Armstrong Forest. Numerous community meetings were held with the Whitesand First Nation as part of the native consultation process. The MNR and the Whitesand First Nation signed a Memorandum of Agreement in December 2000 to promote protection of values, harvest and silviculture opportunities and training. Under the Memorandum of Agreement, the Whitesand First Nation participated in prescription development for protection of native values, developed a joint submission package regarding forestry training, received an allocation of 550,000 cubic metres in an overlapping licence on the Armstrong Forest for the 2000-2005 period, and secured a contract for 70,000 cubic metres annually from Buchanan Forest Products.

The Red Rock First Nation and the Fort William First Nation are members of the Lakehead forest management planning team. A member of the Red Rock First Nation joined the Lake Nipigon West Area LCC in May 2001. The Fort William First Nation and the Red Rock First Nation continue discussions with Greenmantle Forest Inc. for membership in Superior North Loggers Inc.

A member of the Lac Des Mills Lac First Nation is on the LCC for the Dog River-Matawin Forest.

As a result of Collins community involvement with the Armstrong FMP, the MNR and Domtar continue to discuss economic opportunities for members of the community. A Terms of Reference for ongoing and enhanced consultation with the Collins community was developed.

In 2001/02, the Whitesand First Nation delivered 39,100 cubic metres of softwood and 9,300 cubic metres of hardwood from their allocation. Additional wood harvested during 2001/02 will be hauled in the 2002/03 season.

In December 2001, the Red Rock First Nation declined membership in the Superior North Loggers Inc. but agreed to harvest a 145 hectare block to be included in the Lakehead FMP. In 2001, the Red Rock First Nation also had a contract to harvest approximately 1,140 cubic metres from 4.1 hectares for the purpose of clearing a Ministry of Transportation aggregate pit.

On the Dog River-Matawin Forest, an area of 150 hectares was set aside for harvest by the Lac des Milles Lac First Nation.

Niigaani Enterprises from the Gull Bay First Nation has a harvest allocation of 18,534 cubic metres on the Spruce River Forest.

There are 16 local residents employed by Whitesand Forestry in road construction, harvesting, processing, layout and office support. Whitesand Forestry was provided with numerous renewal and tending contracts, including site preparation, manual tending, pre-commercial thinning and regeneration surveys.

A Red Rock First Nation community representative completed a Native Background Information Report and Native Values Maps for the Lakehead FMP.

In April 2001, Bowater Pulp and Paper Canada Inc. was issued a Forest Resource Processing Facility

Licence for the purpose of constructing a sawmill on Fort William First Nation land.

Timmins District

Management units: Romeo Malette Forest, Shiningtree Forest, Timmins Forest, Timmins Management Unit and portions of Pineland Forest and Spanish Forest

Mattagami is the only First Nation in the District. Flying Post Reserve is also within the Timmins District boundary but all residents live off reserve, mainly in Nipigon. Other interested First Nations include Matachewan, Moose Cree, Wahgoshig, Wahnapitae, White Fish, Sagamok and Taykwa Tagamou.

Several First Nation communities participated on the Nighthawk forest management planning team, including Mattagami, Matachewan, Taykwa Tagamou, Wahgoshig and Moose Cree. A First Nations Advisory Committee was established to enhance representation on the planning team as opposed to participating on the LCC. This committee provides a forum for First Nations to discuss issues and concerns and provide positive suggestions for improvements and changes to the planning process.

Matachewan Band Council, in conjunction with the MNR developed a herbicide strategy for the Timmins Forest. Matachewan representatives and elders identified potential values and verified the location of existing values on the Timmins Forest.

Shining Tree Forest Inc., Tembec and Domtar are continuing discussions with the Mattagami First Nation for forest management opportunities on the Shining Tree Forest, the Romeo Malette Forest, the Spanish Forest and the Pineland Forest. Domtar and Tembec have supplied a letter of support with regards to future allocation for the Mattagami First Nations and to secure funding for training in Forest Operations under T&C #77. In 2001/02, the Mattagami First Nation had a contract for harvesting 26,000 cubic metres in the Shining Tree Forest. The Timmins District reported 38 First Nations workers employed in Little John Enterprises and Ostrum mills.

The MNR Gogama area office co-sponsored three co-op students in the Aboriginal Technician Program at Sault College and hired three summer Forest Technicians from the Mattagami First Nation. Domtar Inc. and the MNR Gogama office participated in a Career Development Day at the Mattagami First Nation. A Cross-Cultural Awareness session was held on the Mattagami reserve with Timmins District staff and Mattagami community members participating. Workshops focused on cultural awareness, relationship building and history.

Work continues with the Mattagami First Nation to digitize its identified values and document attributes in the MNR's Natural Resource Values Information System.

Discussions continue with the Mattagami First Nation regarding other relevant resource issues including trap-lines, nuisance beavers and the establishment of a trapper's council.

Wawa District

Management units: Big Pic Forest, Black River Forest, Magpie Forest, Nagagami Forest, Wawa Forest, and White River Forest

The three First Nations located in the Wawa District are Hornepayne, Michipicoten, and Pic Mobert. The Pic River, Ginoogaming and Missanabie Cree First Nations have traditional lands in the Wawa District and have an interest in forest management within the District.

The Michipicoten First Nation hosted a non-timber forest products workshop in 2001. It was also involved in discussions with Wawa Forest Products for their support of a hardwood mill proposal.

Open houses for the Big Pic FMP were held on the Pic River, Pic Mobert and Ginoogaming reserves in October 2001. In addition, open houses for the White River FMP were conducted on the Pic River and Pic Mobert reserves in December 2001.

The Pic Mobert First Nation had contracts with Domtar for the planting of 201, 577 trees

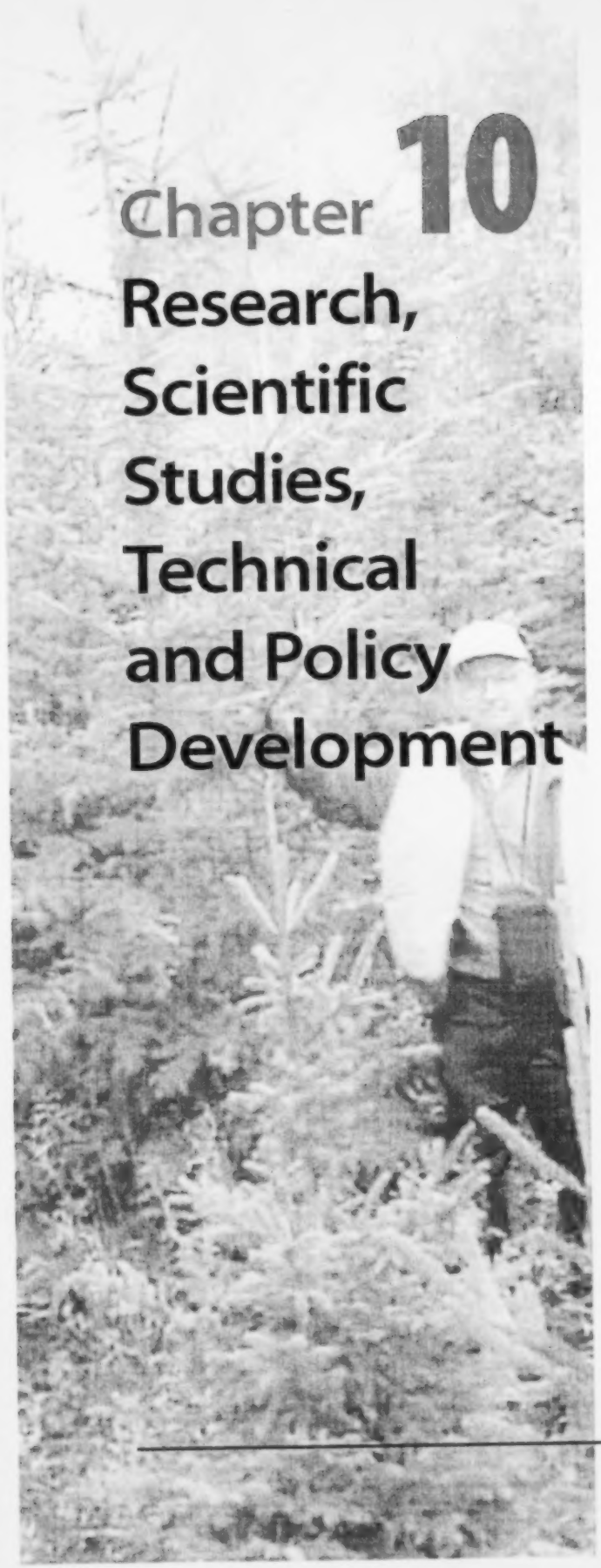
and the thinning of 400 hectares on the White River Forest. The First Nation also showed an interest in blueberry cultivation and collecting essential oils, but no business plans have been submitted. The Pic Mobert First Nation has seven members employed in the forestry sector (mill and bush operations).

The Pic River First Nation also has an overlapping licence to harvest 16,850 cubic metres annually on the Black River Forest, an additional allocation of 16,850 cubic metres on the Big Pic Forest and an allocation of 30,000 cubic metres on the White River Forest. The Pic River First Nation has 28 members employed in the forestry sector.

Two members of the Missanabie Cree First Nation Band Council attended the Introduction to Forest Management Planning Workshop.

Staff from Marathon Pulp Inc. attended cultural awareness training.

The Hornepayne First Nation has an estimated 36 members employed in the forestry sector.



Chapter 10
Research, Scientific Studies, Technical and Policy Development

The MNR keeps pace with the constantly expanding knowledge base for sustainable forest management through research, scientific studies, and technical and policy development programs. These studies and programs span a wide range of subjects, including: the development of new and improved data and information sources; the creation and implementation of new policies, procedures, and guidelines for forest management planning (now called forest management guides); the development of new forest management methods, models, and tools; and, continuing long-term monitoring programs and scientific studies.

This chapter outlines the progress the MNR has made, in co-operation with its partners, on specific scientific, technical, and policy development programs up to, and including, 2001/02.

New and Improved Data and Information Sources

Silvicultural Effectiveness (T&C #96)

A comprehensive and consistent silvicultural effectiveness monitoring program is critical to ensuring the sustainability of Ontario's forest resources. It provides the basis for measuring, collecting, analyzing and reporting information on the renewal and state of Ontario's public forests, whether they have been depleted by harvest or natural means. This information is needed not only by the people and companies managing the forest, but also by the owners of the forest - the public.

In 2001/02, the MNR published the *Silvicultural Effectiveness Monitoring Manual for Ontario*. Its purpose is to describe Ontario's Silvicultural Effectiveness Monitoring program, providing consistency in how this necessary information will be treated and reported. Consistent definitions and standards ensure that results from forest management activities on similar sites and forest conditions are comparable from stand to stand and from management unit to management unit across the province.

The manual highlights those aspects of the current forest management planning process that relate

to silvicultural effectiveness monitoring, and explains the link between those individual components. It generally describes Ontario's silvicultural effectiveness monitoring program, comprised of objective setting (section 2), standards and assessment methodology (section 3), compilation and reporting (section 4), and analysis and evaluation (section 5).

Work has also continued on survey methodologies used to collect silvicultural effectiveness information. In particular, the Silvicultural Treatment, Assessment and Reporting System is a computer-based data collection and analysis system designed to simplify silvicultural effectiveness monitoring. Refining the *Free Growing Regeneration Assessment* manual is continuing as well. This manual is a regeneration assessment system intended for application to all species and stands managed under the clearcut silvicultural system. These systems, when fully developed, will be used by the MNR to substantiate its spot checks and by independent forest auditors to conduct their field assessments of regeneration.

Forest Ecosystem Classification Program (T&C #97)

Forest Ecosystem Classification in Ontario was integrated into the broader provincial Ecological Land Classification (ELC) program, which is mandated with the establishment of a comprehensive and consistent province-wide framework for ecosystem description, inventory, and interpretation. The ELC program is required to address a full range of scales from ecoregionalization to site/community level. The combination of consistent classification and ecosystem-based inventory tools is pivotal to the achievement of the MNR's objectives for ecologically sustainable resource management. The ELC is intended to provide a common language and information framework for planning, management, and monitoring. The current mandate is derived from legal requirements of the Timber Class EA approval, as well as the need for ecologically-based planning and reporting at various scales.

Traditional forest inventory is focused on commercial species without an ecological context. Current work in the ELC is intended to facilitate a shift to a comprehensive, multi-scaled ecological inventory in which traditional forest inventory information is embedded.

During 2001/2002, ELC sampling continued in Southern Ontario. This fourth year of comprehensive data collection brings the southern data set to approximately 1,400 plots.

Data collection was also continued in the far northern portion of the province. In addition to further reconnaissance and preliminary data collection, detailed ELC plots were established in the vicinity of Pikangikum/Berens River, Goose Lakes, Aguta Moraine and Windigo Lakes. Data collection in the far north will continue for the remainder of the 2003 season with a special emphasis on capturing forested systems.

Throughout Ontario, work is ongoing to further integrate forest growth and yield data collection with ELC methodology. Joint data collection standards have been prepared and growth plots are now characterized with appropriate soil, vegetation type and ecosite designations. Collaborative work has also begun with the National Forest Inventory program.

The first approximation of the ELC for Southern Ontario, published two years ago, has been reprinted twice due to popular demand.

Training courses in the use of the ELC were offered across the province to a wide array of natural resources professionals, non-government organizations, First Nations, forest industry, and partner organizations. A comprehensive training manual and CD training package were prepared for the Southern Ontario ELC. Training has been provided to the National Forest Inventory staff.

Work continues on various aspects of integrated inventory approaches, based on a comprehensive training manual for photo-interpretation and inventory published for the Northwest ELC. Substantial portions of Northwestern Ontario continue to be mapped.

Using both the ELC classification approaches and the new ELC-based inventory, draft definitions were developed for old growth forest conditions in Ontario, and circulated for technical review. These

have now been officially released and are available through the MNR website.

Additional ELC-based interpretations dealing with non-timber forest products, intensive forest management, and forest management planning continue to be developed.

During 1999/00, the ELC program undertook a full conceptual and technical review. A revised system architecture and technical standards was completed during 2000/01. Presented at a multi-constituent workshop in January 2001, the revised architecture for the ELC was endorsed for completion. Pending funding and approval to proceed, future work will focus on: completing core classification products based on the revised provincial classification architecture; developing spatial technologies for ecosystem inventory at various scales; and providing practical management applications of the ELC for management planning processes, through the development of interpretive tools.

Areas of Natural and Scientific Interest (T&C #99)

Areas of Natural and Scientific Interest are areas of land and water containing natural landscapes or features that have been identified by MNR as needing protection of such values as natural heritage appreciation, scientific study, or education. They are classified as either life science, earth science, or combined, and are protected during forest management planning through the AOC process.

During the 2001/02 fiscal year, implementation of *Ontario's Living Legacy Land Use Strategy* continued to be the primary focus of protected area efforts. However, a substantial amount of effort was also directed to developing methods for implementing the Room to Grow components of the Ontario Forest Accord. This work involved developing consensus on remaining gaps among the three signatory parties to the Accord, and developing an approach for displaying the gaps identified by the MNR and the Partnership for Public Lands on a single map product. It also involved creating a methodology that incorporated the values of the forestry sector, the water-power sector, the mineral sector, some First Nations considerations, land tenure, and other conservation values.

Further development of approaches for dealing with representation requirements north of the Area of the Undertaking proceeded as well.

Life Science

Reconnaissance and detailed life science inventories were conducted in several additional protected areas confirmed through the Ontario's Living Legacy (OLL) planning process, as well as in several previously existing protected areas, in preparation for the development or revision of plans for these sites. Consultations on boundary refinements for OLL protected areas, in preparation for regulation, also were held.

Conservation land securements continued to be achieved through a partnership with the Nature Conservancy of Canada, utilizing various mechanisms including purchases, donations and conservation easements. These securements were concentrated in the southern part of the province.

The MNR continued to participate with partners from Michigan, Wisconsin, Minnesota, Manitoba, and Ontario, in an ecoregional planning project for the Superior Mixed Forest Ecoregion [including ecoregions 4W and 5S in Ontario]. MNR staff also took part in another cross-border conservation project, the North American Bird Conservation Initiative, involving partners from Quebec, New York, Pennsylvania, and Ohio. Their participation in this initiative particularly concentrated on Bird Conservation Region 13 (mainly comprising Ecoregions 6E and 7E).

Earth Science

The main focus of the earth science conservation program during 2001-2002 continued to be on *Ontario's Living Legacy Land Use Strategy*. Detailed earth science inventories were completed for new OLL protected areas. In addition, reconnaissance-level earth science checksheets were completed for most of the remaining OLL protected areas. These reports provided background information to the planning and regulation processes of the new properties and several of these documents contributed to manage-

ment planning of existing provincial parks enlarged by OLL additions.

Work to identify significant earth science features in the Great Lakes Heritage Coast Signature Site also continued. In addition, the refinement of candidate protected areas for the Room to Grow initiative in the Lake Nipigon area was completed.

Growth and Yield Studies (T&C #100)

Growth and Yield is an empirical branch of forest science that attempts to understand and predict the growth, composition and productivity of forest stands through time. Forest resource managers require accurate growth and yield information as a prerequisite to sustainable forest management. The Forest Growth and Yield Program was established in 1991 to provide Ontario's forest managers with better information on the growth and dynamics of Ontario's forests as influenced by site, forest structure, silvicultural treatments, and natural events.

An accurate and efficient method of determining growth and yield is through the use of Permanent Sample Plots (PSPs). The growth of a forest can be estimated directly by taking repeated measurements on various ecosystem elements. Beginning in 1992, a province-wide network of new PSPs was established over a range of forest sites and management conditions. Data collected from these PSPs provides information to forest managers and researchers on site and soil conditions, vegetation composition, tree growth, regeneration and mortality, and wildlife habitat conditions in Ontario's forests. To date approximately 1,100 PSPs have been established as part of this program. In 1999, efforts shifted from PSPs to Permanent Growth Plots (PGPs), which were easier and less expensive to establish and provided the basic information to meet forest industry needs. Although not as comprehensive, the PGPs also contributed to the MNR's permanent plot network.

In 2001/02 the Growth and Yield Program focused primarily on three main areas: the establishment of new PGPs; the relocation, maintenance, and remeasurement of existing plots; and the continuation of forest modelling projects.

Establishment of New Plots Efforts to install new single-day PGPs in co-operation with the forest industry were continued in 2001/02. PGPs are 400 square metres in area, intended to track wood fibre growth and be responsive to forest management planning needs. They differ from PSPs in that each PGP measures only one-third the area of a PSP, they provide limited mortality data, and they currently do not monitor all non-timber attributes, such as coarse woody debris. During 2001/02, 533 new PGPs were established.

Another project funded through the Forestry Research Partnership (Tembec Industries Inc., the MNR, Canadian Forest Service (CFS), and the Canadian Ecology Centre) resulted in the establishment of a network of PGPs to measure the impact of single-tree selection harvesting of tolerant hardwood stands. These plots are similar to other PGPs, except they are 1,000 square metres instead of the standard 400 square metres. A manual was developed to standardize the assessment of these plots. During 2001/02, 85 of these plots were established under pre-harvest conditions, and the first post-harvest assessment was completed on 22 plots.

Twelve new PSPs and twenty-three PGPs were also established north of the Area of the Undertaking as part of the Northern Boreal Initiative.

Relocation, Maintenance, and Remeasurement of Existing Plots An effort was made to maintain and remeasure as many provincial PSPs as funds permitted. During 2001/02, 30 existing provincial PSPs were remeasured; almost all the plots established in 1992 were remeasured.

A concerted effort was also made to relocate historical plot systems and historical data. In most cases, these historical PGPs were established by the forest industry in the 1950s and later abandoned. In other instances, this plot relocation work focused on relocating PGPs that were established by the MNR years ago for other purposes. Relocating and remeasuring these old plot systems, along with recovering their corresponding data, provides growth and yield estimates not otherwise available from the current provincial PSP network. During 2001/02, 94 historical/abandoned PGPs were remeasured.

The Growth and Yield Program continued the restructuring, updating and cleaning of the Provincial Growth and Yield Database, and the development of PSP Factsheets for distribution to clients.

Modelling Projects The Growth and Yield Program continued investigation and development of a growth and yield-model called FVS^{ONTARIO} (Forest Vegetation Simulator Ontario). The Growth and Yield Program has joined with the Forestry Research Partnership (between MNR, Tembec Inc., and the CFS) to validate the model for forest types in the Boreal Forest region. Future work will involve calibration of this model for Great Lakes - St. Lawrence Forest types.

The Growth and Yield Program has continued the development and transfer of Stand Density Management Diagram software, including the establishment of new coefficients for trembling aspen, white spruce and balsam fir.

The Growth and Yield Program has also partnered with the forest industry to continue developing new benchmark yield curves for the forest management planning process. These new yield curves use current analytical techniques and best available data to provide better information for standard forest units used in the provincial Strategic Forest Management Model.

New Policies, Procedures, and Guidelines

Clearcut Restrictions (T&C #27(c))

MNR's *Forest Management Planning Manual for Ontario's Crown Forests* requires documentation for all planned clearcut areas by size class, and the rationale for any clearcut areas that exceed 260 hectares in size. These new reporting requirements began with the 1996/97 harvest year (but were reported in the following year in management unit annual reports). Provincial level reports were included for the first time with the 1998/1999 annual report. Results from these reports were included in the *State of the Forest Report, 2001* (Indicator 1.1.3).

Water Crossing Removal Criteria Development (T&C #52(e))

A committee of technical experts from the MNR, the Ministry of the Environment and Energy, and the forest industry developed a set of criteria for use in decisions on the removal of water crossing structures for roads destined for abandonment. The set of criteria, which addressed biological, engineering, water quality, and safety considerations, is outlined in an October 1997 report, *Criteria for the Removal of Water Crossings of Abandoned Roads.*

Environmental Guidelines (T&C #94(b))

The MNR was required by the Timber Class EA approval to produce an implementation manual, the *Environmental Guideline for Timber Management Activities.* This document was to provide direction regarding timber harvest layout, configuration, and clearcut sizes, and to address the protection of the physical environment in the course of forest harvest, renewal, and maintenance.

To meet this requirement, the MNR developed an implementation manual released in two parts: 1) protection of the physical environment and 2) timber harvest layout, configuration, and clearcut sizes.

Forest Management Guidelines for the Protection of the Physical Environment was published in December 1997 in response to the first part.

The MNR undertook background analysis of natural disturbance patterns in response to the second part. Also, as the result of a condition on the denial of a request for an individual Environmental Assessment on the 1999 Temagami Forest Management Plan (November 1999), the MNR was required by the Ministry of the Environment to produce a first draft of the *Forest Management Guidelines for the Emulation of Fire Disturbance Pattern* by September 30, 2000 and complete the final document by May 31, 2001. The deadline for the final document was later extended to November 30, 2001. As with other forest management guides, the Provincial Forest Technical Committee (a public advisory body) provided advice during the development of the guide. A multi-disciplinary writing team, with representatives from the MNR, the forest industry, and environmen-

tal organizations, was formed in December 1999 to begin writing the guide.

Following the completion and 60-day public review of the first draft in the Fall of 2000, a two-day workshop was held in February 2001 to elicit further input from individuals representing the MNR, the forest industry, Aboriginals, environmentalists, anglers and hunters, tourist operators, trappers and prospectors. The writing team then prepared the final draft document, with the revised title of *Forest Management Guide for Natural Disturbance Pattern Emulation*. On August 31, 2001, this draft was placed on the Environmental Bill of Rights Environmental Registry for a 60-day public comment period. Similar to the first draft, approximately 1,500 comments were received. These were considered and, where possible, incorporated into the final document, published as the *Forest Management Guide for Natural Disturbance Pattern Emulation* on November 28, 2001. Transfer of the new guide to the MNR and the forest industry staff began immediately, and continued throughout the remainder of the year.

NATURAL DISTURBANCE PATTERN EMULATION

With the publication of the *Forest Management Guide for Natural Disturbance Pattern Emulation*, Ontario is improving its forest practices so that forest biodiversity and natural processes will be better maintained. This is being accomplished by emulating, as closely as possible, the forest conditions that are produced by forest fires.

The fundamental principle in emulating natural disturbance is to regenerate Ontario's forests in more natural patterns, ensuring the needs of wildlife species are met and that healthy, diverse ecosystems and their many benefits are passed on to future generations.

Guidelines for Pine Marten and Pileated Woodpecker Habitat (T&C #94(c))

The MNR was required by the Timber Class EA approval to develop two new documents: 1) *Forest Management Guidelines for the Provision of Marten Habitat* and 2) *Forest Management Guidelines for the Provision of Pileated Woodpecker Habitat*. As previously reported, both guides were completed in May 1996.

Northern Ontario Wetland Evaluation System (T&C #98)

As reported in the 1995/96 annual report, the requirement to develop a Northern Ontario Wetland Evaluation System has been delivered. The evaluation system was designed to allow a relative ranking of the importance of wetlands based on numerical scores assigned to biological, physical, and social attributes. Wetlands that are highly ranked are considered to be of provincial significance and are protected by wetlands policy. A system for evaluating wetlands in Southern Ontario has been in place since 1984. This system was modified for use in Northern Ontario. *The Ontario Wetland Evaluation System: Northern Manual* was published in March 1993, with a revised manual released in May 1994.

In Northern Ontario, MNR district office staff assess whether planned forest operations have the potential to impact a wetland and decide whether to evaluate and rank these areas. If a wetland is identified as provincially significant, it is designated a value within the forest management planning process. Forest operations in wetland areas must be designed in accordance with AOC planning requirements. The publication of the northern wetlands manual, and the subsequent release of explanatory technical notes in 1995 and 1996, improved the use of the evaluation system. These tools enable forest management planning teams to identify wetlands on the basis of their ecological features, values, and functions.

The Ontario Wetland Evaluation System: Northern Manual is to be updated through work being conducted as part of the ELC Program (T&C #97), and will continue to be applied in forest management planning.

Old Growth Conservation Strategies (T&C #103(a))

The goal for the conservation of old growth is ensuring it is maintained in the forest landscapes of Ontario now and into the future.

As previously reported, the MNR released a draft old growth policy proposal, *A Conservation Strategy for Old Growth Forest Ecosystems on Crown Lands in Ontario* for public review and comment in 1997. Further work on this policy proposal was postponed while efforts were diverted towards enhancing parks and protected areas through *Ontario's Living Legacy Land Use Strategy*. Meanwhile, an MNR-wide team was established to develop definitions of old growth specific to Ontario forest conditions. Its findings were compiled into a draft technical report on old growth forest definitions that was slated for release in spring 2002.

In 2001, the MNR completed the definitions and compiled them into a report, *Draft Old Growth Forest Definitions for Ontario - a work in progress*. On March 28, 2002, the draft definitions report was released for public review and comment through the Ontario Environmental Bill of Rights Registry. The draft definitions report describes old growth for forest communities and tree species found across the province. The descriptions define old growth according to age and the length of time that older trees survive.

The definitions are organized according to a provincial land classification system that provides an understanding of the soil, site conditions, plant community diversity, etc. They are needed to support the further development of the draft 1997 old growth policy proposal.

In 2001, the MNR resumed work on the old growth policy proposal. The definitions report was to be finalized after the old growth policy was completed in spring 2003.

Planners and resource managers will use the old growth policy and definitions report to support Ontario's continuing efforts to maintain old growth in Crown forest landscapes across the province.

Roadless Wilderness Areas Policy (T&C #106)

In May 1997, the MNR released Version 1.0 of a policy entitled *Ontario's Approach To Wilderness*, as required by T&C #106. The Roadless Wilderness Areas Policy states that wilderness values will be accounted for under the auspices of land-use planning and resource management planning, such as MNR's Lands For Life planning process (now OLL), and under policy, legislation, and management programs developed in support of sustainable natural resource management in Ontario. The Road-less Wilderness Areas Policy states that the MNR will engage in three specific initiatives. The MNR is currently working in the following areas to support these initiatives.

Identifying and establishing outstanding wilderness parks and wilderness zones As stated in *Ontario's Living Legacy Land Use Strategy*, the MNR has concluded that the park class targets have been achieved to the extent possible within the Planning Area. Consideration will continue to be given to the park class targets in planning for the portions of ecoregions and ecodistricts that extend beyond the Land Use Strategy Planning Area. A planning and consultation process will be created to consider future suggestions for areas that may provide improved representation of natural heritage features. Any potential protected areas will be subject to broad public consultation through a formal planning process. Wilderness zones within park boundaries will be identified through parks management planning.

Continuing to work with partners and clients in order to protect wilderness values in Southern Ontario Work is ongoing in Southern Ontario, and will be completed under the auspices of *Nature's Best, Parks and Protected Areas: A Framework and Action Plan*. For example, the Ontario Parks/Nature Conservancy of Canada Land Acquisition Program (formerly Legacy 2000), the MNR/Nature Conservancy of Canada Community Conservancy Program, and the Natural Areas Protection Program are continuing to protect significant natural heritage values. Private land stewardship initiatives, such as the Conservation Land Tax Incentive Program, also contribute to the protection of significant values.

Identifying and defining the extent to which programs implemented on the intervening landscapes and waterscapes contribute to the maintenance and enhancement of wilderness characteristics An internal working group was formed by the MNR to address the management of wilderness characteristics on the intervening landscapes, outside parks and other types of protected areas, and to determine if there are any changes required to existing resource management and operational planning guides. The working group, comprised of MNR staff, developed a draft discussion paper examining the extent to which programs implemented on the intervening landscapes and waterscapes contribute to the maintenance and enhancement of wilderness characteristics. This discussion paper is currently undergoing MNR review.

District Land Use Guidelines (T&C #110)

In July 1999, the MNR released the approved *Ontario's Living Legacy Land Use Strategy*. Wherever the Land Use Strategy and the 1983 District Land Use Guidelines address the same topics or areas, the *Ontario's Living Legacy Land Use Strategy* provides the current direction. The District Land Use Guidelines continue to provide some detailed land use and resource management direction.

In early 2001, the MNR initiated a major project to consolidate the existing local land use direction for Crown lands from the Land Use Strategy, District Land Use Guidelines, and other special area plans. Work on this project continued throughout 2001/02. It will lead to the release of a *Crown Land Use Policy Atlas* that will be available on the Internet and in printed form.

A preview of the Atlas was provided at a major public forum that was held in November 2001. Once fully operational, the Land Use Atlas will replace existing local land use direction, including the District Land Use Guidelines. Future changes to local land use policies will occur through amendments to the Land Use Atlas, with appropriate public consultation.

In 2001/02, no revisions to the District Land Use Guidelines were formally proposed, and one minor amendment to the Land Use Strategy was initiated.

New Forest Management Methods, Models, and Tools

Tending and Protection Improvement Programs (T&C #102)

The MNR has several ongoing projects related to pest management (insects and diseases) and vegetation management. Either on its own, or in partnership with other provinces and the private sector, the MNR has funded a number of research projects in these two areas.

Pest Management

The CFS has been supported by the MNR in the testing of neem, a botanical insecticide, for the control of insects affecting trees. This product is effective against insects, such as sawflies, which are not susceptible to the commonly-used product *Bacillus thuringiensis* (B.t.).

In particular, the MNR has supported studies examining the aquatic impacts of neem, as well as the development of methodologies for its aerial application. The work is being performed in partnership with the CFS, the County of Simcoe, and the provinces of New Brunswick and Newfoundland.

Other projects related to the pest management aspect of T&C #102 include:

- support of a CFS study into the impacts, ecology, and control methods for pine false webworm (in partnership with the Department of National Defence and the County of Simcoe);
- testing of the Advanced Integrated Multidimensional Modelling Software 2 (AIMMS 20) guidance system, which uses weather parameters from the forest canopy to adjust the location of aerial spray lines, minimizing off-target drift and optimizing the even deposit of the spray over the target stand (in partnership with the provinces

of New Brunswick and Manitoba, and Forest Protection Limited);

- support to the CFS to test a naturally-occurring virus to control introduced pine sawfly and pine false webworm;
- testing of new B.t. products for controlling spruce budworm (in partnership with the CFS, and with funding from pesticide manufacturers);
- ongoing trials to refine the pheromone for jack pine budworm for use as a detection method and possible control measure (in co-operation with Simon Fraser University, the CFS, and the New Brunswick Research Productivity Council);
- support to the CFS in an ongoing research project to develop early intervention strategies to reduce, or slow, the build-up of spruce budworm populations;
- support to the University of Toronto to examine the role of natural enemies in the population dynamics of the European pine shoot beetle, a recently introduced insect;
- support to the CFS for research towards developing a hazard rating system for pine shoot beetle;
- support to the CFS to conduct field trials of new lures for trapping pine shoot beetle, in collaboration with the U.S. Forest Service;
- support to a University of Toronto study into the impacts of site preparation methods on the biodiversity of insect fauna, in collaboration with Domtar Inc;
- a study conducted by the MNR into the impacts of pine false webworm on native pines;
- funding of a graduate student with the University of Toronto to assess bark beetle responses to the 1998 ice storm;
- funding to the CFS to develop field guides to the insects of Ontario conifers, and insects of Ontario hardwoods;
- funding for and participation in a CFS study of vegetative competition of white pine and white spruce; and
- funding for a CFS study on the interactions of forest tent caterpillar defoliation and carbon sequestration in aspen stands.

Vegetation Management Alternatives

Since 1991, the Vegetation Management Alternatives Program has focused on reducing dependence on herbicides in Ontario's forests by developing effective, safe, economically-viable alternatives, along with a better understanding of forest ecosystems. This has been achieved through basic and applied research, education, and field delivery, and includes the following accomplishments:

- maintained partnerships with Natural Resources Canada, academia (Lakehead University, University of Guelph, and Sault College); forest industries (Abitibi-Consolidated Inc., Bowater Pulp and Paper Canada Inc., Clergue Forest Management Inc., Domtar Inc., Grant Forest Products Inc., Mackenzie Forest Products Inc., Tembec Industries Inc., Weyerhaeuser Canada Ltd., and Westwind Forest Stewardship Inc.); and non-government organizations (Upper Lakes Environmental Research Network [ULERN] and Forest Engineering Research of Canada [FERIC]) to ensure the continuation of established trials and the initiation of new trials;
- with support from the Living Legacy Trust, continued data collection, produced an interim report and conducted two field tours on an environmental impact study established in 1995 near Parry Sound. This study examined the effects of a shelterwood system regeneration cut and four site preparation techniques on the components of white pine ecosystems, including: the overstorey (health, seed production); white pine regeneration (establishment, ecophysiology, response to competition); and, ecosystem components (plant diversity and succession, carabid beetle and salamander populations, downed woody debris, and nutrients);
- reassessed seven vegetation management treatment studies (Nipigon Ground Release, Mattawa, South River, Cartier Lake Experimental plantation, Foleyet Experimental plantation, Domtar Intensive Forest Management (IFM), and chemical site preparation study);

- reassessed four plant competition studies (Inter-specific critical periods, Wharncliffe white pine, Arboretum, and competition tolerance of black spruce, jack pine, and white pine);
- provided support to the CFS and Tembec Industries Inc. for a project designed to gain a better understanding of how and when to target vegetation management efforts to maximize white pine production and quality;
- received funding from the Living Legacy Trust to initiate the IFM Science Partnership: NEBIE (Natural disturbance, Extensive, Basic, Intensive, and Elite) Plot Network, involving selection and assessment of four sites in the boreal forest. This study will include natural, extensive, basic, intensive and elite silviculture treatments, and assessments of soils, biodiversity, fibre production and economics;
- developed the beta version of an expert system to help forest managers use prescribed fire to manage red oak;
- developed a height growth response model, based on the Arboretum Study;
- provided vegetation management advice to forest managers;
- provided manual vegetation management training to Parry Sound and Temagami District First Nations;
- assisted Sustainable Forest Licence holders in assessing the effectiveness of aerial spraying of herbicides on the release of white pine regeneration in white pine shelterwoods, with support from Tembec Industries Inc.;
- presented research results at the Ontario Vegetation Management Association and Expert Committee on Weeds conferences;
- published research results in the Ontario Forest Research Institute newsletter;
- published three papers in the *Canadian Journal of Forest Research* on the effects of vegetation management alternatives from the Fallingsnow Ecosystem Project, two on the competitive effects of boreal plants on jack pine from the Arboretum study, and a note in *Phytopathology* on the competitive effects of aster;
- published site preparation and release chapters in *Regenerating the Canadian Forest*;
- completed an information report on the effects of sheep in Northeastern Ontario;
- continued to work on the *Guide to Opportunities* (a series of notes on vegetation management alternatives) and the *Plant Autecology Guide*; and
- completed a web-based site vegetation management publication, led by Natural Resources Canada.

Socio-Economic Analysis (T&C #104)

As identified in the 1995/96 annual report, a Socio-Economic Impact Model (SEIM) has been developed by the MNR to help determine the economic and social impacts of non-timber values and alternative forest management scenarios in forest management planning.

Training on the model is ongoing with forest management planning teams, and the model is updated as required. SEIM is continually updated as Statistics Canada revises the underlying input/output database, and newer Census of Population information becomes available. The most current version, SEIM2000, measures impacts using ecological regions, the MNR's district boundaries, and results from the 1996 Census of Population.

Socio-economic impact analysis is fully operational in the forest management planning process. During the development of each Forest Management Plan, the advantages and disadvantages of management alternatives are assessed using SEIM.

A variety of research initiatives focusing on non-market valuation techniques and their applicability in Ontario have also been sponsored and assisted by the MNR. These initiatives built upon a series of reports completed and published under the MNR's Forest Values project. A diverse range of methods and issues were examined, including the effects of congestion on a recreational experience, net economic benefit from canoeing in Ontario, social values of wilderness areas, and economic value of big game hunting.

The MNR has also undertaken internal investigations, and has developed a methodology to determine non-timber values from existing administrative records. Results from the investigation of non-timber values have been used by the MNR to support land-use decisions, including support provided for the development of *Ontario's Living Legacy Land Use Strategy*.

Strategic Forest Management Model

The Strategic Forest Management Model (SFMM) is used in Ontario to explore forest management strategies and options and to evaluate potential resource benefits, including available supplies of wood products, areas of potential wildlife habitat, and measures of forest diversity. It is used by the MNR to help model and project the development of Ontario's forests through time, in light of natural forest dynamics and the effects of human intervention. SFMM can be used to project the future forest condition, forest dynamics, available wood supply, potential wildlife habitat, and forest diversity through time horizons of 150 to 200 years.

It is used widely by the MNR and other forest resource organizations, including consultants and forest products companies. It is the core tool used by forest management planning teams to develop management alternatives, including the Available Harvest Area. This model is also used to support other areas of business such as land-use planning and regional wood supply strategies.

The MNR continues to develop and enhance the features of SFMM in response to users' analysis needs. In the past year, SFMM version 2.1 was released and included enhancements for sensitivity analysis, term weighting, age class grouping, and results reporting. Support for users of SFMM is provided through a website and training courses.

Biodiversity Assessment, Landscape Management, and Wildlife Habitat Supply Modelling (T&C #107)

T&C #107 required MNR to examine wildlife habitat supply modelling methodologies and landscape management methodologies as potential means of addressing biological diversity concerns. The Environmental Assessment Board recognized rapid advancements were occurring in both computer modelling capabilities and methodologies which had potential to answer concerns about biodiversity.

Landscape Ecology

The Forest Landscape Ecology Program continues to assess the effects of natural change and human activity on biodiversity and forest sustainability at the landscape level. The Forest Landscape Ecology Program accomplished the following in 2001/02 fiscal year:

Boreal Forest Landscape Dynamics Simulator (BFOLDS) The development work continued on BFOLDS, a raster-based, spatially-explicit, and stochastic model, which predicts landscape-scale fire disturbance regime and subsequent forest cover change over long time periods (>200 years) and large areas (> 3 million ha). Spatial databases needed to implement BFOLDS were assembled, which included forest cover, soil, terrain, climate, and historical disturbances. Using this database, the version 1.0 of BFOLDS was tested in two large boreal forest study areas in Northern Ontario (each over 3 million ha). The simulation study results were presented to the Provincial Forest Technical Committee in support of the development of District Guidelines for FMP natural disturbance templates. The test results were also presented at the meeting of the International Association for Landscape Ecology, and the annual meeting of the Ecological Society of America. As well, BFOLDS was used in a case study to demonstrate the simulation modelling approach to understanding old growth forest potential in northern landscapes. These results were presented at the Canadian National Symposium on Old Growth Forests in an invited paper.

Boreal Vegetation Transition Matrix Further development work continued on the Boreal Vegetation Transition Matrix version1.0, a raster-based, spatially-explicit, and stochastic model, which predicts the forest succession in boreal forest at

landscape scales (as a part of BFOLDS). Three projects are underway to improve the Boreal Vegetation Transition Matrix: to develop a spatial module of seed-dispersal and early recruitment of tree species; to create a spatial-bias module to eliminate random noise in predictions; and to compile a spatial database of forest cover chronosequence. Two research reports and two journal manuscripts on this model were also published.

Emulating Natural Forest Disturbances An international science symposium was slated for May 2002, with over 60 Canadian and international scientists presenting on various aspects of the concepts and applications. The goal is to generate a broad and rigorous science foundation to the *Crown Forest Sustainability Act* direction of emulating forest disturbances. The proceedings of this symposium will also provide information for the forest management landscape guide, which is being developed by the Forest Policy Section.

Spatial Assessment of Intensive Forest Management feasibility on Tembec Industries Inc. Forest Land Assessment of the potential for IFM (over eight million hectares) was conducted, as a part of the Forestry Partnership composed of the MNR, the CFS, the Canadian Ecology Centre, and Tembec Inc. This study examined the spatial feasibility of practicing IFM given the forest, and other land use policies and guidelines, as well as ecological factors such as geo-climate, fire, and biotic disturbances. The results were presented through several workshops, to audiences ranging from Tembec personnel (operational, planning, and executive), MNR staff (policy, planning, and science), and members of the Great Lakes Forest Alliance.

Net Primary Productivity Assessment System The development and testing of the Net Primary Productivity Assessment System continued. The goal is to provide a rapid and inexpensive monitoring method of net primary productivity at sub-regional scales, in support of the MNR's forest management planning process. A user workshop and training seminar was delivered, in addition to a presentation at the annual meeting of the Ecological Society of America.

Wildlife Habitat Supply Analysis

Wildlife habitat supply modelling investigation and development work continues. A habitat supply model has been developed. The Ontario Wildlife Habitat Assessment Model (OWHAM) includes spatial models for moose, deer, pileated woodpeckers, and red-shouldered hawks for the Great Lakes-St. Lawrence Forest region and models for marten for both the Boreal East and the Great Lakes-St. Lawrence Forest regions. This model is used to assist in the implementation of the pileated woodpecker and marten guides in the Great Lakes-St. Lawrence and Boreal East Forest regions. Work has also continued on Marten Analyst, to be used in the application of the marten habitat guide in the Boreal West Forest region. A combined habitat and population model for marten has been acquired and is being tested in support of the eventual evaluation and revision of the marten habitat guide.

A spatial allocation model (STANLEY) for use with SFMM is under development and evaluation. The nonspatial wildlife habitat relationships models (used in SFMM) for the Boreal East and Great Lakes-St. Lawrence Forest regions are being revised based on increased availability of empirical data.

Multiscale, spatially-explicit habitat models are being developed for moose, caribou, and forest songbirds, using the newly-developed spatial modelling language (LSL), which will also be used to assess natural disturbance patterns so the landscape patterns created by forest harvesting will better match those of natural disturbance patterns. The research will define "spatial signatures" representing various types of natural disturbance.

Alternative forest habitat classifications to "Habitat Units" are being examined in the experimental studies. The alternatives include aggregates of Ecosites into vegetation groups (V-groups) and standardized Forest Units, classed by seral stage. This work is conducted under T&C #80 (Landscape Analysis of Wildlife Habitat). Study areas include the

Cochrane and Iroquois Falls forests (forest birds) in Northeastern Ontario, and the Black Sturgeon and Spruce River forests (forest birds), Wabigoon Forest (moose), and Lac Seul Forest (caribou) in Northwestern Ontario.

Geographic Information Systems (T&C #108)

Geographic Information Systems are designed to aid in the capture, storage, organization, analysis, and presentation of complex geographic data using computer systems. They are essential for the full development of modern resource management methods, models, and tools.

In 1994, the MNR selected a GIS software standard. This GIS has been installed in all MNR district and area offices. As well, systems are installed in regional offices, science units, research units, and systems development units. Systems, software, and technical training have been provided.

The MNR continues to be a forerunner, and is recognized as Ontario's Lead Agency, with respect to Land-Related Information and GIS. It has the lead for the establishment and co-ordination of Geomatic Service Centres across the Land and Resources Cluster. It has developed the Land Information Ontario program which offers leadership within the province for all geospatial data providers and users to make geospatial data affordable, accessible and integratable. This program enhances efficiency by collecting data once and using it many times. The Land Information Ontario program will move the government, the key data providers, business sectors, and Ontario's strong geomatics industry into leadership roles in managing geospatial information and developing decision support tools.

In April 2001, the *Forest Information Manual* was regulated. This manual prescribes the mandatory information and information products required by the Minister and Sustainable Forest Licence holders regarding managing and sustaining Crown forests in Ontario in accordance with the *Crown Forest Sustainability Act* and its regulations. The *Forest Information Manual* includes the requirement for the provision of spatial data both to and from forest industry.

Long-Term Monitoring Programs And Scientific Studies

Provincial Wildlife Population Monitoring (T&C #81)

T&C #81 of the Timber Class EA approval was initiated in 1995 through partnerships with other monitoring agencies. In 1996, the MNR established the Wildlife Assessment Program, staffing three locations in North Bay, Timmins, and Thunder Bay. Under the direction of the Provincial Terrestrial Assessment Program, it maintained these monitoring partnerships with external parties and continued to implement its monitoring approach across the Area of the Undertaking during 2001/02.

Wildlife Assessment partnership activities included ongoing support for Bird Studies Canada to monitor forest bird migration, owls, and red shouldered hawks, as well as support for the University of Guelph's long-term small-mammal monitoring in Algonquin Park. The forest bird survey partnership with the Canadian Wildlife Service also continued and Wildlife Assessment Program staff began contributing to the *Second Ontario Breeding Bird Atlas* by serving on the technical committee and collecting data in a form compatible with the Atlas. The Wildlife Assessment Program increased the number of plots established and began initial monitoring studies of small mammals, forest birds and amphibians across a network of 116 randomly selected, geographically distributed, permanent sample sites representative of major forest types. A protocol documenting standardized sampling methods for salamander surveys was published and monitoring of furbearer distribution and relative abundance through trapper mail surveys was continued. The Wildlife Assessment Program, through the Provincial Terrestrial Assessment Program, has developed a central database as a repository for its data.

Long-Term Scientific Studies (T&C #80)

Tourism Effects Research

This study is designed to assess the effectiveness of the provincial *Timber Management Guidelines for the Protection of Tourism Values*, to determine the effects of forest management on tourism values, and to recommend improvements to the guide. The major initiative of this study for 2001/02 is summarized below.

Work on the comparative economic resource-based tourism project continued. This project takes a comparative approach to understand what role, if any, current forest management practices have on the revenues operators generate from tourism establishments.

The two major components of the project during the year were the development of a predictive model for the fly-in fishing tourism product and data collection for the road-accessible tourism product.

The predictive model estimates the importance that various environmental and facility- related characteristics have on the prices charged at fly-in fishing tourism sites. It provides evidence of the likely impacts that both forest harvesting and forest fires have on the prices set by tourism operators for a fly-in fishing package.

Considerable efforts were also invested in enumerating road-accessible tourism sites, developing a database of environmental and facility-related characteristics of these sites, and surveying tourism operators. This data is necessary for the development of a hedonic price model for the road-accessible tourism product.

Moose Guidelines Evaluation

This project is evaluating the effectiveness of Ontario's *Timber Management Guidelines for the Provision of Moose Habitat*. It will assess the effects of current forest management practices on moose and other wildlife habitat, and recommend improvements to the guide. The following activities were carried out in 2001/02:

- Landsat 7 satellite imagery was acquired for the Moose Guidelines Evaluation Project study area for the 1995-2000 time period. Mosaic images were created and geo-registered for each year of the project. Spectral classification of the multi-year satellite images was completed. Spectral classes were assigned to landcover classes (e.g., cutovers) and change detection analysis was performed to determine where new cutovers occurred each year. Appropriate Forest Resources Inventory data for the study area were assembled.
- Location data from GPS collars deployed on 128 cow moose during the January 1995 to January 2001 period were differentially corrected to provide 3-7 m accuracy, using GPS base station files collated and converted to appropriate formats in 2000/01.
- Participation in the development of biotelemetry data analysis protocols to address issues of data handling, collation, and analysis was continued, through the Chair in Biotelemetry at the University of Waterloo, in agreement with Lotek Engineering Inc.
- Development of home range analysis software was continued and the previously developed software was revised to allow direct import of new Lotek GPS-collar data files.
- Sections of the *Timber Management Guidelines for the Provision of Moose Habitat* were revised based on previous studies of moose aquatic feeding areas and calving sites carried out as part of the Moose Guidelines Evaluation Project.
- Continued analysis of body measurements and condition scores, ultrasound measurements of back fat, blood, hair and fecal samples in conjunction with a M.Sc. thesis on the relationship between moose condition and habitat use was to be submitted to the Department of Biology, Lakehead University.
- A study of moose aquatic feeding areas in the Great Lakes-St. Lawrence Forest was initiated by a graduate student in the Department of Biology, Lakehead University.

Landscape Analysis of Wildlife Habitat

This research program is examining the effects of the *Timber Management Guidelines for the Provision of Moose Habitat* and other forest management practices, on wildlife populations and habitat. The research was initially restricted to moose, but since linked with T&C #107, it is now also examining the effects of spatial patterns created by dispersed block cutting (moose guide) versus aggregated cutting (fire emulation guide).

The focus of the research is on characterizing the effects of logging on habitat patch size and configuration, and on developing predictive models of how changes in landscape configuration influence the quality of wildlife habitat. An important component of this research is comparing landscape patterns created through logging with those created by natural disturbance processes.

A multi-scale, habitat-modelling tool (LSL/CPAT) is being developed to facilitate spatially-explicit habitat modelling, and evaluation of other spatial objectives, as defined in Forest Management Plans. This computer program, when completed and tested, could assist in implementing new directions in both the moose habitat guide and in the emulation of natural fire disturbance patterns.

Field work to develop and test spatial models is now entering its third year, with this year's work focused on testing models developed on data collected in the first two years. One objective of the study is creating a spatial habitat model of breeding bird distribution, so there are heavy sampling demands.

Two study sites have been established: the Cochrane and Iroquois Falls forests (Northeastern Ontario), and the Black Sturgeon and Spruce River forests (Northwestern Ontario). The CVX microphone system is being used to facilitate rapid collection of songbird biodiversity data. This project, in collaboration with the Wildlife Assessment Program, receives in-kind support from the Forest Fire Management Program and the Cochrane District.

Two other important collaborative studies have been initiated through the OLL program. A study of breeding birds in the Red Lake Forest is assessing whether the marten habitat guide will provide sufficient direction to conserve forest songbirds. Another project is studying the effects of forest management on breeding songbirds in Northern Ontario. Both studies will use the CVX microphone system, and follow similar data collection protocols, with the objective of sharing data among research programs.

Aquatic Effects Research

These long-term scientific studies are designed to determine the effectiveness of the provincial *Timber Management Guidelines for the Protection of Fish Habitat*, with an emphasis on the numerical measurement and modelling of land-use effects on aquatic ecosystems in Northern Ontario. To date, aquatic effects research has been addressed through two integrated projects: the Coldwater Lakes Experimental Watersheds and the Comparative Aquatic Effects Program.

The Coldwater Lakes Study was initiated north-west of Atikokan in 1990, to experimentally evaluate the effects of logging on lake ecosystems and to provide information about the effectiveness of shoreline reserves in preventing those effects. Five years of intensive pre-harvest monitoring (1991-1995) was followed by extensive experimental logging in 1996 (large cuts) and 1998 (secondary cuts), and four years of post-harvest monitoring (1997-2001). Minor to moderate aquatic impacts, similar to those caused by wildfire, were observed in the three impacted lakes. These effects are associated primarily with increased groundwater yield after the forest trees are removed, and are noted through temporary increases in nitrogen, potassium, and dissolved organic carbon in lake water, which temporarily decreases water clarity and increases lake productivity.

The Comparative Aquatic Effects Program began in 1995 to document the impacts of forest management activities on stream ecosystems in Ontario's Boreal Forest, and to test the effectiveness of current forest management guides on preventing or minimizing these effects. To date, the program has

focused on measuring timber-harvest impacts on coldwater streams, since coldwater stream habitat and biota are expected to be relatively sensitive to disturbance in the surrounding catchment. The program is investigating a number of areas, including the key aquatic habitat variables, to monitor the effects of timber harvest, the spatial scale of harvest impacts on aquatic ecosystems, the use of buffer strips to prevent sediment from moving overland and into waterways, the effects of logging roads as barriers to fish migration, and the development of GIS-based tools to predict the location of small, unmapped streams that may serve as fish habitat.

These and other early results (many now published in primary scientific literature) suggest that the widespread use of shoreline reserves under the 1988 *Timber Management Guidelines for the Protection of Fish Habitat* and accompanying policy may be conservative in some respects if roads and water crossings are correctly planned and constructed. It is likely that some shoreline forest reserves may be safely harvested and regenerated without harm to aquatic habitat or water quality, as part of a landscape-scale forest disturbance plan. An extensive, collaborative research program among MNR, industry, and university personnel is underway to monitor shoreline forest management and to test the reliability of previous studies and their relevance to other areas of Northern Ontario.

Full-Tree Harvesting and Long-Term Site Productivity (T&C #101)

This project was established in 1993 to provide a quantitative assessment of the effects of full-tree harvesting and full-tree chipping on ecosystem processes, which ultimately may influence site productivity for a range of black spruce-dominated ecosites. A companion study, headed by the CFS, is being conducted on jack pine. A total of nine core study sites, three harvested in 1994 and six in 1995, were included in the experimental harvest component of the MNR's black spruce project.

In 2001/02, field and laboratory work focused on the eighth year remeasurement for three of the experimentally-harvested sites. The other six sites will be measured during the 2002/03 field season. These measurements were designed to quantify changes in soil physical (e.g., bulk density, porosity), chemical (e.g., pH, Carbon and macronutrient reserves), and biological (e.g., microbial biomass) properties resulting from the harvest treatments over the range of site types being examined. In addition, seedling growth (e.g., total height and increment, root collar diameter) and nutrition (e.g., foliar chemistry) measurements were taken to examine trends in early seedling performance.

The project team published an establishment report (Duckert and Morris 2001: CNFER Technical Report TR-008) in 2001 which summarizes the work completed on the project to date.

Appendices

Appendix 1 Key to Management Units (April 1, 2001). (Designated under the Crown Forest Sustainability Act, Section 7)

Appendix 2 Total Provincial Area by Satellite and Forest Resources Inventory Classifications, 2001 (all areas in thousands of hectares)

Appendix 3 Forest Management Plans Approved for Implementation in 2001, and Plans Scheduled for Approval and Implementation in 2002, 2003, and 2004

Appendix 4 Forest-dependent Communities in Ontario (ranked by percentage of forestry workers)

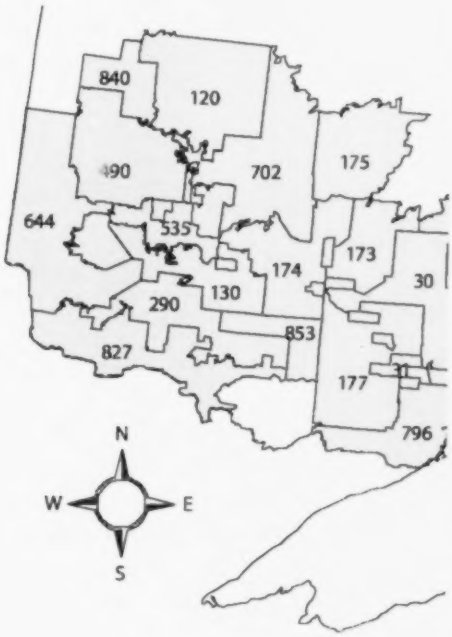
Appendix 5 Forest Renewal Charges for 2001/02 ($ per cubic metre)

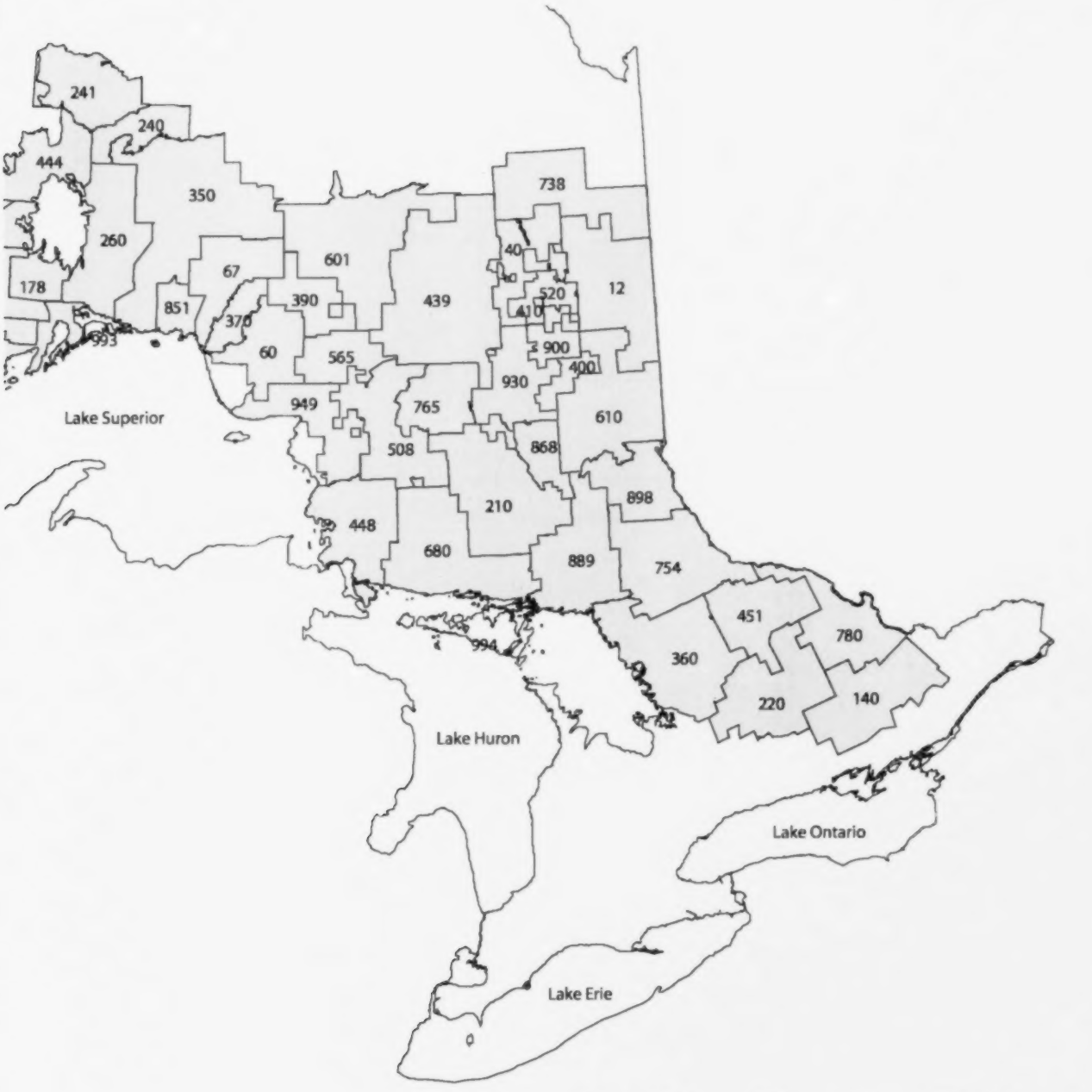
Appendix 6 Acronyms Used in this Report

Appendix 1 Key to Management Units (April 1, 2001). (Designated under the Crown Forest Sustainability Act, Section 7)

MNR Region	MU #	Management Unit Name	Status[1]
Northeast	448	Algoma Forest	SFL
	067	Big Pic Forest	SFL
	370	Black River Forest	SFL
	520	Cochrane	CR
	410	Driftwood Forest	SFL
	438	Gordon Cosens Forest	SFL
	601	Hearst Forest	SFL
	012	Iroquois Falls Forest	SFL
	565	Magpie Forest	SFL
	738	Moose River	CR
	390	Nagagami Forest	SFL
	754	Nipissing Forest	SFL
	680	Northshore Forest	SFL
	765	Pineland-Martel Forest	SFL
	930	Romeo Malette Forest	SFL
	868	Shiningtree Forest	SFL
	040	Smooth Rock Falls Forest	SFL
	210	Spanish Forest	SFL
	889	Sudbury Forest	SFL
	508	Superior Forest	SFL
	898	Temagami	CR
	610	Timiskaming Forest	SFL
	900	Timmins	SFL
	400	Timmins Forest	SFL
	949	Wawa Forest	SFL
	060	White River Forest	SFL
Northwest	444	Armstrong Forest	SFL
	178	Black Sturgeon Forest	SFL
	173	Brightsand Forest	SFL
	175	Caribou Forest	SFL
	177	Dog River-Matawin Forest	SFL
	535	Dryden Forest	SFL
	174	English River Forest	SFL
	827	Fort Frances-Flanders Forest	SFL
	290	Highrock Forest	SFL
	350	Kenogami Forest	SFL
	644	Kenora	CR
	651	Kiashke River	CR
	702	Lac Seul Forest	SFL
	260	Lake Nipigon Forest	SFL
	796	Lakehead Forest	SFL
	240	Nakina North Forest	SFL
	241	Ogoki Forest	SFL
	851	Pic River Ojibway Forest	SFL
	840	Red Lake Forest	SFL
	853	Sapawe Forest	SFL
	030	Spruce River Forest	SFL
	120	Trout Lake Forest	SFL
	130	Wabigoon Forest	SFL
	490	Whiskey Jack Forest	SFL
Southcentral	451	Algonquin Park Forest	AFA
	220	Bancroft-Minden Forest	SFL
	360	French-Severn Forest	SFL
	140	Mazinaw-Lanark Forest	CR
	780	Ottawa Valley Forest	SFL
	990	Southern Ontario[2]	CR

[1] Status - Forest Management Planning Responsibility
SFL - Sustainable Forest Licence
CR - Crown
AFA - Algonquin Forest Authority
[2] Southern Ontario (MU # 990) is south of the AOU





Produced by: Forest Evaluation & Standards Section – Forest Management Branch

Appendix 2 Total Provincial Area by Satellite and Forest Resources Inventory Classifications, 2001 (all areas in thousands of hectares)

	Total Provincial Area - Satellite Classes				Total Inventoried Area - FRI				Total - Planning Area - FRI			
Land Class	Crown	Parks	Other	Total	Crown	Parks	Other	Total	Crown	Parks	Other	Total
Forested Land												
Productive Forest	44,401.4	4,962.8	6,371.8	55,736	30,010.2	4,109.9	6,071.2	40,191.3	25,582.5	3,941.4	4,159.1	33,683.0
Non-Productive Forested Land												
Wetland/ Open Muskeg [1]	9,693.0	1,398.9	70.8	11,162.7	885.9	149.4	246.8	1,282.1	785.6	139.5	180.9	1,106.0
Treed Muskeg [2]	13,360.1	1,001.6	393.8	14,755.5	2,229.8	270.9	99.1	2,599.9	1,161.7	223.6	80.0	1,465.3
Tundra	25.7	33.0	0.0	58.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brush & Alder [3]	n/a	n/a	n/a	n/a	903.3	99.1	237.0	1,239.4	727.1	92.8	164.9	984.9
Rock	294.6	98.4	127.8	520.8	266.9	118.9	100.9	486.7	228.2	118.0	91.7	437.9
Subtotal non-productive forested	23,373.3	2,531.9	592.4	26,497.7	4,286.0	638.3	683.8	5,608.1	2,902.8	573.9	517.4	3,994.1
Non-Forested Land												
Developed Agricultural Land	8.3	3.5	4,454.0	4,465.8	14.7	1.1	3,925.8	3,941.7	2.8	0.3	418.2	421.4
Grass & Meadow	121.0	3.3	1,268.3	1,392.6	13.1	1.3	858.9	873.3	6.1	0.4	222.1	228.6
Unclassified Land	129.2	9.0	438.6	576.8	366.2	25.3	938.2	1,329.7	359.2	21.5	249.6	630.3
Sub-total:	258.4	15.8	6,161.0	6,435.2	394.0	27.7	5,722.8	6,144.6	368.1	22.3	889.9	1,280.3
Water	8,199.7	1,476.8	359.3	10,035.9	6,755.3	924.4	21.6	7,701.3	5,433.4	888.1	20.7	6,342.3
Water (Great Lakes)	8,886.9	0.0	0.0	8,886.9	1,082.0	45.5	2.4	1,129.9	0.0	0.0	0.0	0.0
All Water	17,086.6	1,476.8	359.3	18,922.8	7,837.3	969.9	24.0	8,831.3	5,433.4	888.1	20.7	6,342.3
Grand Total:	85,119.8	8,987.3	13,484.5	107,591.7	42,527.6	5,745.8	12,501.9	60,775.3	34,286.8	5,425.7	5,587.2	45,299.7

[1] Includes "Wetland" satellite class
[2] Includes "Treed Bog & Fen" and "Swamp" satellite classes
[3] Not available as satellite class

Appendix 3 Forest Management Plans Approved for Implementation in 2001, and Plans Scheduled for Approval and Implementation in 2002, 2003, and 2004

Plans Approved for Implementation in 2001

Management Unit Name	MU#	District	Remarks
Bancroft-Minden Forest	220	Bancroft	Amalgamation of Bancroft and Minden
Black River Forest	370	Wawa	
Black Sturgeon Forest	178	Nipigon	
Dryden Forest	535	Dryden	Early renewal by one year
Kenora	644	Kenora	
Lac Seul Forest	702	Sioux Lookout	Amalgamation of Lac Seul Forest and Sioux Lookout Forest
Lake Nipigon Forest	260	Nipigon	Amalgamation of Lake Nipigon Forest and Auden Forest
Mazinaw-Lanark Forest	140	Bancroft	Amalgamation of Mazinaw and Lanark
Nagagami Forest	390	Wawa	Early renewal by one year
Ottawa Valley Forest	780	Pembroke	Formerly Pembroke
Pic River Ojibway Forest	851	Nipigon	Formerly Steel River
Pineland-Martel Forest	765	Chapleau	Early renewal by one year, amalgamation of J. E. Martel Forest and Pineland Forest
Shiningtree Forest	868	Timmins	
Spruce River Forest	030	Thunder Bay	
Superior Forest	508	Chapleau	Early renewal by one year
Timiskaming Forest	610	Kirkland Lake	Amalgamation of Elk Lake, Timiskaming, and Watabeag
Timmins	900	Timmins	

Plans Scheduled for Approval and Implementation in 2002

Management Unit Name (current or proposed)	MU#	District	Remarks
Big Pic Forest	067	Wawa	
Caribou Forest	175	Sioux Lookout	
Crossroute Forest	290/827	Fort Frances	Highrock Forest and Fort Frances-Flanders Forest to be amalgamated (new MU # is 405)
Hearst Forest	601	Hearst	Scheduled for early approval in 2001, implementation in 2002
Lakehead Forest	796	Thunder Bay	
Romeo Malette Forest	930	Timmins	Scheduled for early approval in 2001, implementation in 2002

Plans Scheduled for Approval and Implementation in 2003

Management Unit Name (current or proposed)	MU#	District	Remarks
Cochrane-Moose River	520/738	Cochrane	Cochrane (520) and Moose River (738) to be amalgamated (new MU # is 375)
Nighthawk Forest	410/400/900	Timmins	Driftwood Forest (410), Timmins Forest (400) and Timmins (900) to be amalgamated (new MU # is 150)
Ogoki Forest	240/241	Nipigon	Nakina North Forest (240) and Ogoki Forest (241) to be amalgamated (new MU # is 415)
Red Lake Forest	840	Red Lake	
Wabigoon Forest	130	Dryden	
White River Forest	060	Wawa	

Plans Commencing Preparation in 2002 for Approval and Implementation in 2004

Management Unit Name (current or proposed)	MU#	District	Invitation to Participate – Tentative Date and Remarks
English River Forest	173/174	Dryden	February 2002, English River Forest (174) and Brightsand Forest (173) to be amalgamated
French-Severn Forest	360	Parry Sound	March 2002
Magpie Forest	565	Wawa	March 2002
Nipissing Forest	754	North Bay	March 2002
Temagami	898	North Bay	March 2002
Trout Lake Forest	120	Red Lake	March 2002
Whiskey Jack Forest	490	Kenora	January 2002

Appendix 4 Forest-dependent Communities in Ontario (ranked by percentage of forestry workers)

Census Subdivision	Subdivision Type	2001 Population	Labour Force	Forestry Workers	Percent Forestry
Dubreuilville	Township	967	620	375	60.5%
James	Township	467	235	120	51.1%
Terrace Bay	Township	1,950	1,035	475	45.9%
White River	Township	993	555	250	45.1%
Red Rock	Township	1,233	560	230	41.1%
Dorion	Township	442	220	80	36.4%
Nipigon	Township	1,964	1,010	365	36.1%
Aroland 83	Reserve	346	120	40	33.3%
Smooth Rock Falls	Town	1,830	910	290	31.9%
Ear Falls	Township	1,150	635	180	28.4%
Greenstone	Town	5,662	3,020	805	26.7%
Opasatika	Township	325	135	35	25.9%
Brudenell, Lyndoch and Raglan	Township	1,565	650	155	23.9%
Atikokan	Township	3,632	1,790	425	23.7%
Hearst	Town	5,825	3,260	770	23.6%
Dryden	City	8,198	4,390	1,000	22.8%
Chapleau	Township	2,832	1,455	330	22.7%
Espanola	Town	5,449	2,575	575	22.3%
Rainy River, Unorganized	Unorganized	1,605	865	185	21.4%
Mattice-Val Cote	Township	891	380	80	21.1%
Conmee	Township	748	435	90	20.7%
Val Rita-Harty	Township	1,022	485	100	20.6%
Fauquier-Strickland	Township	678	245	50	20.4%
Chapple	Township	910	515	105	20.4%
Baldwin	Township	624	295	60	20.3%
Matachewan	Township	308	100	20	20.0%
Charlton	Town	276	100	20	20.0%
Gillies	Township	522	200	40	20.0%

Source: Statistics Canada 2001 Census of Population

Appendix 5 Forest Renewal Charges for 2001/02 ($ per cubic metre)

MNR Region	Management Unit	Rates Charged by Tree Species or Groups of Species: White & Red Pine Grade 1	White & Red Pine Grade 2	Hemlock & Cedar	Other Conifer	Poplar White & Birch	Hardwood Grade 1	Hardwood Grade 2
Northwest	Armstrong Forest	$11.00	$11.00	$2.00	$2.00	$0.50	$8.00	$1.50
	Black Sturgen Forest	$11.00	$11.00	$6.00	$7.00	$0.75	$8.00	$1.50
	Brightsand Forest	$11.00	$11.00	$6.00	$6.00	$0.75	$8.00	$1.50
	Caribou Forest	$11.00	$11.00	$5.50	$5.00	$0.75	$8.00	$1.50
	Dog River Matawin Forest							
	Apr. 1/2001 - May 31/2001	$11.00	$11.00	$6.00	$6.00	$0.50	$8.00	$1.50
	Jun. 1/2001 - Mar. 31/2002	$11.00	$11.00	$6.50	$6.50	$0.75	$8.00	$1.50
	Dryden	$6.00	$6.00	$6.00	$6.00	$2.00	$1.50	$1.50
	English River Forest	$11.00	$11.00	$5.50	$6.00	$0.75	$8.00	$1.50
	Fort Frances - Flanders Forest	$11.00	$11.00	$0.00	$5.50	$0.50	$8.00	$1.50
	High Rock Forest	$11.00	$11.00	$0.00	$5.50	$0.50	$8.00	$1.50
	Kenogami Forest	$11.00	$11.00	$4.00	$4.00	$0.70	$8.00	$1.50
	Kenora	$5.00	$5.00	$3.00	$3.00	$0.50	$8.00	$1.50
	Kiashke River	$11.00	$11.00	$6.00	$6.00	$0.50	$8.00	$1.50
	Lac Seul Forest	$11.00	$11.00	$6.50	$3.00	$0.50	$8.00	$1.50
	Lake Nipigon Forest	$2.00	$2.00	$2.00	$2.00	$0.50	$8.00	$1.50
	Lakehead Forest	$11.00	$11.00	$6.00	$6.00	$0.50	$8.00	$1.50
	Nakina North Forest	$11.00	$11.00	$6.00	$2.00	$0.50	$8.00	$1.50
	Ogoki Forest	$11.00	$11.00	$6.00	$2.00	$0.50	$8.00	$1.50
	Pic River Ojibway							
	Apr. 1/2001 - Aug. 31/2001	$11.00	$11.00	$4.50	$4.50	$0.50	$8.00	$1.50
	Sep. 1/2001 - Mar. 31/2002	$11.00	$11.00	$4.50	$2.00	$0.50	$8.00	$1.50
	Red Lake Forest	$1.00	$1.00	$1.00	$3.00	$0.50	$8.00	$1.50
	Sapawe	$6.00	$6.00	$2.00	$2.00	$0.50	$8.00	$1.50
	Spruce River Forest	$11.00	$11.00	$6.00	$6.00	$0.50	$8.00	$1.50
	Trout Lake Forest	$11.00	$11.00	$4.50	$2.00	$0.70	$8.00	$1.50
	Wabigoon Forest	$11.00	$11.00	$2.00	$2.00	$0.70	$8.00	$1.50
	Whiskey Jack Forest	$11.00	$11.00	$5.00	$6.00	$0.70	$8.00	$1.50
Northeast	Algoma Forest	$5.00	$5.00	$6.00	$6.00	$0.50	$6.25	$1.00
	Big Pic Forest	$11.00	$11.00	$6.00	$6.00	$0.50	$8.00	$1.50
	Black River Forest	$11.00	$11.00	$6.00	$6.00	$0.50	$8.00	$1.50
	Cochrane	$11.00	$11.00	$5.50	$5.50	$0.50	$8.00	$1.50
	Driftwood Forest	$11.00	$11.00	$4.95	$4.95	$0.75	$8.00	$1.50
	Gordon Cosens Forest	$11.00	$11.00	$1.00	$3.70	$0.50	$8.00	$1.50
	Hearst Forest	$11.00	$11.00	$2.75	$2.75	$0.40	$8.00	$1.50
	Iroquois Falls Forest	$11.00	$11.00	$2.00	$2.00	$0.50	$8.00	$1.50
	Magpie Forest	$11.00	$11.00	$5.50	$5.50	$0.50	$8.00	$1.50
	Moose River	$11.00	$11.00	$3.00	$3.00	$0.50	$8.00	$1.50
	Nagagami Forest	$11.00	$11.00	$6.41	$6.41	$0.75	$8.00	$1.50
	Nipissing Forest	$11.00	$6.00	$6.00	$6.00	$0.50	$8.00	$1.50
	Northshore Forest	$1.81	$1.81	$1.00	$1.00	$0.50	$2.00	$0.50
	Pineland-Martel Forest	$11.00	$11.00	$6.00	$1.00	$0.60	$8.00	$1.50
	Romeo Malette Forest	$6.00	$6.00	$4.00	$4.00	$0.55	$8.00	$1.50
	Shiningtree	$1.83	$1.83	$1.00	$1.00	$0.08	$1.33	$0.25
	Smooth Rock Falls	$11.00	$11.00	$0.00	$0.00	$0.50	$8.00	$1.50
	Spanish Forest	$6.50	$6.50	$1.00	$1.50	$0.50	$8.00	$1.50
	Sudbury Forest	$11.00	$6.00	$6.00	$6.00	$0.50	$8.00	$1.50
	Superior Forest	$11.00	$11.00	$4.50	$6.27	$0.50	$8.00	$1.50
	Temagami	$11.00	$11.00	$6.00	$6.00	$0.50	$8.00	$1.50
	Timiskaming	$11.00	$11.00	$1.20	$1.20	$0.10	$8.00	$1.50
	Timmins	$11.00	$11.00	$7.20	$7.20	$0.60	$8.00	$1.50
	Timmins Forest	$11.00	$11.00	$7.10	$7.10	$0.75	$8.00	$1.50
	Wawa Forest	$11.00	$11.00	$6.00	$6.00	$0.50	$8.00	$1.50
	White River Forest	$11.00	$11.00	$1.00	$1.00	$0.50	$8.00	$1.50
Southcentral	Algonquin Park Forest	$4.75	$4.75	$0.10	$0.10	$0.10	$4.75	$0.10
	Bancroft-Minden Forest	$11.50	$1.50	$2.00	$2.00	$0.50	$8.00	$1.50
	French-Severn Forest	$11.00	$1.50	$2.00	$6.00	$0.50	$8.00	$0.50
	Mazinaw-Lanark Forest	$11.50	$1.50	$6.00	$6.00	$0.50	$8.00	$1.50
	Ottawa Valley Forest	$11.00	$1.50	$6.00	$6.00	$0.50	$8.00	$1.50
	Southern Ontario	$12.50	$1.50	$6.00	$6.00	$1.50	$8.00	$1.50

Appendix 6 Acronyms Used in this Report

AFA	Algonquin Forestry Authority
AOU	Area of the Undertaking
BFOLDS	Boreal Forest Landscape Dynamics Simulator
B.t.	Bacillus thuringiensis
CFS	Canadian Forest Service
CFSA	Crown Forest Sustainability Act
EA	Environmental Assessment
ELC	Ecological Land Classification
FMP	Forest Management Plan
FMPM	Forest Management Planning Manual for Ontario's Crown Forests
FOCIS	Forest Operations Compliance Information System
FRI	Forest Resources Inventory
FRL	Forest Resource Licence
FTG	Free-To-Grow
IFM	Intensive Forest Management
LCC	Local Citizens Committee
MFTIP	Managed Forest Tax Incentive Program
MNR	Ministry of Natural Resources
MOU	Memorandum of Understanding
NDPE Guide	Forest Management Guide for Natural Disturbance Pattern Emulation
OLL	Ontario's Living Legacy
PGP	Permanent Growth Plot
PSP	Permanent Sample Plot
Room to Grow	Room to Grow: Final Report of the Ontario Forest Accord on Implementation of the Accord
RSA	Resource Stewardship Agreement
SEIM	Socio-Economic Impact Model
SFL	Sustainable Forest Licence
SFMM	Strategic Forest Management Model
Timber Class EA approval	Reasons For Decision and Decision, Class Environmental Assessment by the Ministry of Natural Resources for Timber Management on Crown Lands in Ontario
T&C	Term and Condition (of the Timber Class EA approval)

51114
(5k, P.R. 04 03 26)
ISSN 1485-743X
ISBN 0-7794-5992-X

Printed on
recycled paper.